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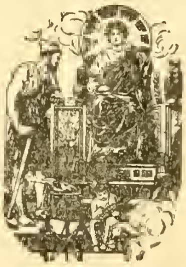

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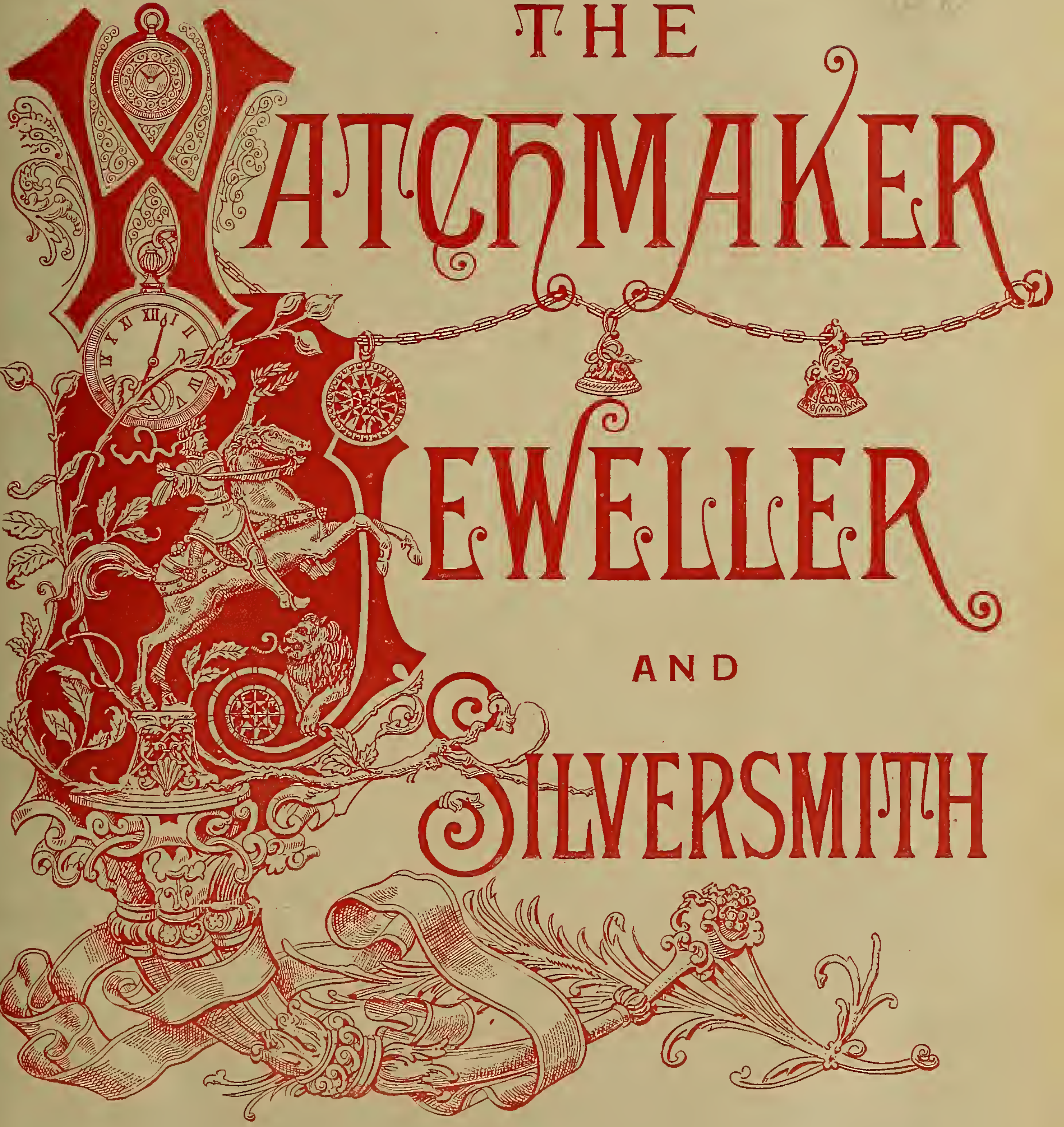
THE WATCHMAKER JEWELLER AND SILVERSMITH



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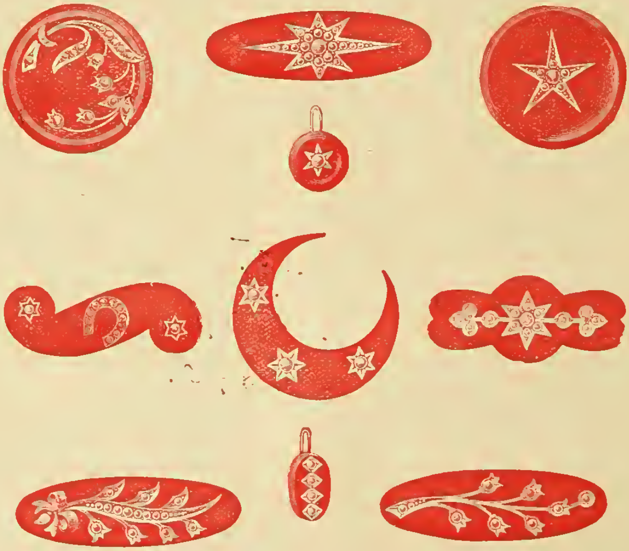

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The Watchmaker, Jeweller and Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

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EDITORIAL

IN entering into another volume of our publication, it is gratifying to note the improvement that is observable in the trades with which we are concerned.

The spirit of hopefulness that to-day animates both manufacturers and dealers is in great contrast to the despondency which existed to such an extent throughout the fancy trades at the time the management of this journal changed hands, some three years since; and, even much more recently, complaints of badness of trade were pretty generally the order of the day. When, in the face of such complaints, we were charged with having optimistic views in predicting a return of business, we adhered to our opinion that the larger volume of commerce transacted by the country at large, as shown by Board of Trade returns and other available statistics, would in the end react favourably on the smaller industries. That we were justified in our belief and its expression is shown by the reports of increased activity in all branches from every manufacturing centre. Opticians, silversmiths, jewellers, platers, watchmakers—all are experiencing the universality and strength of the business revival; a revival of which its slow but steady growth is one of the best auguries.

But the stir that is now going on in manufacturing circles is not altogether the result of business done or of orders received. It is to a large extent preparatory, in expectation of what is to come, and manufacturers are just now expanding every energy in order to meet the "boom" in trade, of which so many indications are to be seen on all sides. The Money that is coming fast into the country may safely be looked upon as already half-way on the road to the purchase of *articles de luxe*, and the confidence which is now characterising the above-mentioned trades will not be misplaced.

THE high prices that have been realised for old silver plate at all the principal sales this season are just now exercising the minds of collectors to find a reason for the extraordinary demand.

As much of this old plate has been purchased for the American market, perhaps its present popularity may be accounted for in the same way as that of the grandfathers' clocks, viz.: the desire to make other people think or to let them know that one had a grandfather.

It is curious to note that, at the recent dispersals, Hall-marked silver has invariably commanded about twice the price of unmarked, and the estimation in which the Hall-mark is thus incontestibly shown to be held, as much by foreigners (if by this name we may designate Americans) as by English buyers, is a strong argument in favour of its permanent retention.

GENERAL NOTES

Not Registered on this Side.—The following is from a Chicago trade journal:—"Blank & Co. report a brisk demand for their new anti-swear cuff button. It is giving universal satisfaction. Remember it is sold only to the retail jewelry trade. No 'notion' or drygoods dealers need apply."

Mining Exhibition.—An exhibition of all the operations connected with gold mining was opened at the Alexandra Palace on the 15th ult., and will be continued until 17th August. The Secretary is Mr. G. L. Hare, 3, Queen Victoria Street, E.C.

A new Eye Disease.—Professor Forster, a German eye doctor, has discovered that the wearing of the modern stand-up collar, by preventing the normal flow of blood to the head, exerts a prejudicial effect upon the eye. He has 300 patients suffering from a chronic complaint which he avers has been brought about by this cause.

Royal Mint.—With the exception of 1887, when a large number of Jubilee pieces were coined, last year was the most profitable in the annals of the Mint. Silver is, of course, the main source of profit to the Mint, and last year the gross profit, or seignorage, as it is called, from this source amounted to £176,339, which is over 53 per cent., to which rate it had grown from 9 per cent. in 1871, owing to the steady depreciation of silver. It is suggested that (in order to avoid the risk of coiners taking advantage of the low price of silver and making counterfeit money of the real quality, which would render detection extremely difficult), more precious metal should be put into the silver currency.

The Sydney Mint.—During the first quarter of the current year the Sydney Mint turned out 445,000 sovereigns and £2,450 worth of silver coin. The head of the Sydney branch of the Royal Mint, Mr. Hunt, is a grandson of the famous literary character, Leigh Hunt.

The Paris Exhibition.—Mr. J. W. Tonks, of the firm of T. and J. Bragg, jewellers, of London and Birmingham, has been appointed one of the jurors for the Paris Exhibition, in the section of Jewellery and Goldsmiths' work. Mr. Julian Tripplin, of Bartlett's Buildings, Holborn Circus, is the English representative of the Horological Jury.

Coventry Technical Institute.—The result of the yearly examination of the Horological Section in theory has been the award of certificates to W. H. Band and to W. Willoughby for papers of equal merit in elementary theory, and one to Howard J. White for an exceptionally good paper on the theory of springing and timing. The teachers' prizes for home work have been awarded, the first one of a guinea to J. J. Farmer, and the second of half-a-guinea to A. Kinder.

At a Meeting of the General Committee of the Coventry Technical Institute last month, Mr. E. Rainbow was appointed joint secretary to the Technical Institute and Science Classes. In consequence of the great increase of students presenting themselves for the Science Classes examination, the duties of hon. secretary have become so onerous that a paid secretary has become a necessity, and this office it has been found convenient to join with the secretaryship of the Technical Institute.

Bracelet Presented to Mrs. Gladstone.—This bracelet, which was presented on May 22nd to Mrs. Gladstone at the recent meeting of the Women's Liberal Federation in commemoration of her golden wedding, is noteworthy for the artistic taste shown in the grouping of the emerald and diamond shamrocks which surround the portrait. The miniature, which is copied from the well-known portrait by Sir John Millais, is painted on ivory. The band of the bracelet is formed of three thin delicate lines of gold enamelled in green and white, and at the back is engraved "25th July, 1839. From the Women's Liberal Federation, 1889." The miniature has been mounted by Messrs. Hancocks and Co., of New Bond Street.

The Science and Art Examinations.—Teachers of science and art classes in London, and possibly throughout the country, are just now extremely indignant at the severity of the papers in the late examinations under the Science and Art Department of South Kensington. The emergency has become so serious that it is considered doubtful whether many teachers will think it worth while to continue at work next year. The pressure is said to be particularly disastrous to the artisan classes. Among the subjects mentioned as extremely arduous are magnetism, acoustics, physiography, solid geometry, steam and electricity. The gravamen of the complaint is that while the ordinary subjects are sufficiently difficult the syllabus has been actually overstepped. One of the questions complained of as being put to elementary students and artisans was "describe shortly the construction of an achromatic astronomical telescope."

Unmarked Wedding Rings.—What is known as the 9-carat wedding ring difficulty has at last been settled, if not to the satisfaction of all parties, at least in a more conciliatory spirit than was at one time shown. The offending manufacturers, against whom proceedings were pending, have jointly published an apology, and agreed to pay a certain sum (the amount of which is not specified) to the Guardians of the Standard of Wrought Plate (that is the correct style of the Birmingham Assay Office authorities) in Birmingham, and have further undertaken not to sell or expose for sale any rings of the offending kind in future, to communicate to their customers the purport of the said agreement, and at the same time to offer to receive back all such rings they may have supplied. In consideration of this undertaking, proceedings in actions already commenced have been stayed and no further action will be taken by the authorities in respect to any sale already made of gold rings coming into the objectionable category.

Action Against Pawnbrokers.—On the 6th ult., Mr. E. Isidore Braun, of Hatton Garden, and other dealers in diamonds and precious stones, sued Messrs. Attenborough and other pawnbrokers in respect of the alleged detention by the defendants of a quantity of pearls and other jewellery, of the value, it was stated, of nearly £1,900. It appeared that the jewellery in question was improperly pawned by a person to whom it had been entrusted with a view of his finding customers for it, and the defendants contended that it was not illegally detained, and they were not liable. Mr. Jelf, Q.C., Mr. Rose Innes, and

Mr. Gray appeared for the plaintiffs; and Mr. Finlay, Q.C., Mr. Poland, Q.C., and Mr. Clarke for the defendants. During the hearing of the plaintiffs' case a settlement was arrived at, it being agreed that the defendants should waive any claim for costs and interest, and should give up the jewellery on payment of the sums advanced. The action was therefore dismissed without costs.

Discovery of Ancient Jewellery.—In digging the foundations of the new Palace of Justice in Rome has been found, at the depth of eight mètres, a marble sarcophagus bearing the name of Crepereia Triphæna, with the lid still firmly fastened with rivets of iron imbedded in lead. Inside was the skeleton of a woman, upon which were found (1) a pair of gold earrings with pearl pendants; (2) a gold necklace with hooks of *pietra dura*; (3) a large and elegant gold brooch having a carved amethyst representing a stag fighting with a hippogriff; (4) a thick gold ring with a setting of cornelian representing two hands clasped, with two other rings of the same kind, one bearing the name Filetus; (5) a ring composed of two gold circles conjoined, but moveable; (6) a long amber spiral pin; (7) two combs of boxwood; (8) a silver box; and a few other objects. With the skeleton lay a very delicately carved *bambino* of hard wood, about 30 centimètres high, and once gilt, the arms and legs being in full relief.

Illegal Pawning.—In the Birmingham Police Court, Ebenezer Sadler, jewellers' case maker, Vyse Street, Birmingham, late of 9, Pitsford Street, was charged on the 20th ult. with illegally pledging five gold lockets, the property of Mr. Taylor, jeweller, of Great Hampton Street. Chief-inspector Van Helden stated that the lockets which prisoner was charged with pledging had been obtained by him from prosecutor on approbation. Three of the lockets were pawned with Mr. Davis, of Smallbrook Street, and two with Mr. Carter, of Aston Street. Witness arrested prisoner on Wednesday, and in a desk at his office discovered about thirty or forty pawn-tickets relating to watches, bracelets and other articles of jewellery. Witness wished for prisoner to be remanded for a week, in order that enquiries might be made into the case. The magistrates granted the remand, and allowed prisoner bail, himself in £50, and two sureties in £25 each.

Burmah Ruby Mines.—Sir Lepel Griffin presided on the 24th ult. at the Cannon Street Hotel over the statutory general meeting of the shareholders of this Company. He stated that the Company was registered on February 26th last. The number of ordinary shares offered to the public was 200,000, and within a few hours 2,762,000 shares were applied for. He spoke of the difficulties the Company had to face in carrying on its operations owing to the disturbed state of the country, but expressed his belief that in a short time Burmah would settle down into that state of order and peace which reigned elsewhere in the Queen's dominions. The question of communication was also a matter of difficulty. The mines were situated in the heart of a mountainous country, but the road to Mogok was expected to be finished in a couple of months from May 20th, the date of their superintending engineer's first official report. The prospects of the Company were not only as good, but they were distinctly better than when investors in the shares were rushing down New-court for prospectuses.

The Heraldic Institute (Incorporated) of the British Empire.—The Council of the Incorporated Heraldic Institute is about to issue a complete series of illustrated genealogical directories upon an entirely new plan. These exceptional works will be copiously illustrated by portraits, arms, tabular pedigrees, and seats of the peers, commoners, members of the learned profession, and Government officials of Great Britain, Ireland, India and the Colonies. The volumes of this library will be published serially, and will give a complete history of those men and their families who have made the British Empire what it is by their eminence in statecraft, law, religion, medicine, arts, and commerce, and from the catholicity of their contents cannot fail personally to interest every family of the English-speaking race. The Institute undertakes genealogical and heraldic inquiries of all kinds, as well as the execution of the highest examples in art, in heraldic engraving, painting, brass and marble work, jewellery, and enamelling of all periods. The Secretary's address is, care of Genealogos, 16a, Grafton Street, London, W.

The Waltham Watch Company.—At the annual meeting of the Waltham Watch Company in Boston recently, it was voted to increase the capital stock of the company by 1,000,000 dollars, making the total capital 3,000,000 dollars. A cash dividend of 50 per cent. was also declared. The treasurer of the company, in explaining the matter, said that the company had a surplus of 2,000,000 dollars above its capital. The capital stock had been increased to the extent of the cash dividend, and those of the stockbrokers who wished could take the cash they received in dividends and purchase new stock at par in *pro rata* proportion to what they already held. It was not a stock dividend. The other 1,000,000 dollars surplus would be used in carrying on the business of the company. There would be no additions to the works on the head of the increase of stock. In 1865, when the stock was 300,000 dollars, a dividend of 150 per cent. was made, and the stock increased to 750,000 dollars. In 1888 a dividend of 100 per cent. was made and the capital increased to 1,600,000 dollars; and in 1885 the stock was increased 500,000 dollars, for which the stock holders paid.

Australian "Rubies."—Mr. Streeter's lapidaries, while going through the nearly a million carats of Australian "rubies" which he bought from the New Zealand Loan Company for £5, came across jacinths and hyacinths. Mr. Streeter has just presented to the Adelaide School of Mines several specimens of stones and gems. The collection includes a fine specimen of Burma ruby, good colour; five rough rubies from Mogoh; two cabochon-cut rubies from Mogoh; calspar showing small ruby; five pieces spinal ruby from Upper Burma; and ruby quartz from Mogoh. Other stones are tourmaline from Momeit State, adjoining Mogoh; crocidolite, called catseye, from South Africa; large and fine opal, cut, from Queensland; opal in matrix from Queensland; emerald running through quartz, from Bogota, Colombia; cabochon sapphire, showing "star," from Tasmania; one rough sapphire from Tasmania; sunstone in the rough; another sunstone, cut; and petrified wood from Arizona. It is quite evident from the foregoing list, as a contemporary observes, that Mr. Streeter wants to give the Australians some idea as to what is and what is not a ruby!

Another "Diamond King."—Among the monarchs who have been recently created is, according to the *European Mail*, now to be numbered Mr. Joseph Mylchreest—a man who is well known on the principal gold fields of Australia and California, but more particularly on the "fields of blue" at Kimberley, where he amassed the handsome fortune which he is now enjoying at his pleasant home in the Isle of Man. Mr. Mylchreest was one of the early pioneers of the diamond fields at Kimberley, where he appears to have started with the proverbial half-crown in his pocket, and amassed a property in a few years upon the proceeds of which he has been enabled to retire from active work altogether. When the amalgamation movement came up the interests held by Mr. Mylchreest at Kimberley were secured by Mr. Cecil Rhodes for the sum of £115,000; and, with a "pile" in addition to this, the sagacious Manxman retired to his native town of Peel, where he now enjoys life at his ease, and, according to all accounts, does much to add to the comfort and happiness of those around him. He has an open hand and a ready purse for any charitable object that comes in his way, and the popular voice of his fellow-citizens in the Isle of Man now proclaims him the "Manx Diamond King."

Robbing an Employer.—Joseph Slater, jeweller's clerk, living at the back of 33, Spencer Street, Birmingham, was placed in the dock last month, on a charge of stealing four gold bracelets, three pairs of earrings, one brooch, three pins, and a cross, of the value of £15, the property of his employer, Mr. M. Evans, manufacturing jeweller, 64, Northampton Street. The prosecutor stated that he had lately missed articles of jewellery of the value of upwards of £50. He gave information to the police, with the result that Detective-inspector Ore arrested the accused. The whole of the articles were found to have been pledged at various pawn-shops in the town. Prisoner pleaded guilty. Mr. Evans said that he had employed the prisoner since February last. He then bore an exceedingly good character. His parents were respectable people, and the accused had had a good example set him. Prisoner said that he had to superintend a funeral, and to do this he had to borrow money to purchase various articles. The man who lent him the money had pressed him for it, and in order to repay him he gave way to the temptation offered him. The Stipendiary said he would impose the most lenient punishment he could—three month's imprisonment, with hard labour.

A Large Pendulum.—The longest pendulum on the American continent, by means of which the earth's rotation is demonstrated, has been set up in the technological school at Atlanta, Georgia, by Dr. J. S. Hopkins, president of the school. The pendulum is a heavy pear-shaped piece of iron attached to a brass wire 42 feet long. The upper end of the wire is pivoted in a steel point which rests on the centre of a steel plate so as to cause the least possible friction. The swinging of the pendulum gradually describes a circle on the floor in a direction following the sun, showing in this way that "the earth do move." Directly underneath the pendulum is a large circle divided into 24 parts of 15 degrees each, to correspond with the hours of the day. The North Pole is placed directly under the pendulum, and the meridians of longitude meet there. The parallels of latitude make smaller circles inside the first. The experiment is performed as follows :—The iron is brought to the edge of the circle in the meridian of Atlanta, and let swing across. Apparently it goes straight across, but gradually it traverses the circles in the direction taken by the sun, and opposite to the revolution of the earth. The pendulum not being directly over the axis of the earth, does not move in exactly the same time as the sun, but falls behind some hours a day. It is said that, if it were at the North Pole, where it would be immediately over the axis, it would traverse the circle in exactly 24 hours, and at the Equator it would not traverse it at all, for gravity would operate to prevent it.

The Diamond Market.—A small but increasing demand has characterised the *Amsterdam* market during the month that has gone, the latest report being that factories are again fully at work. *Rough* remains dear, as are also *Cleavages*, both being in good demand. The *Paris* trade shows signs of reviving, and a good summer season is anticipated. As usual Americans are the biggest buyers in this market, local speculation being almost at a standstill.

The supply of stuff from the *Cape* for the London market has been considerably below the average, which has kept prices somewhat higher. The usual steamers arrived during the month, and although the shipments were smaller, the quality of the goods was better, and a fair amount of parcels changed hands.

Metals.—*Silver*—The unsold portion of the latest consignments for Chili was placed at 42d. per oz. ; *Copper*—Latest quotations, good ordinary brands and G. M. B.'s, cash, £40 17s. 6d. to £41 5s. ; three months, £40 12s. 6d. to £41 ; Australian, nominal ; *Tin*—Fine foreign, cash, Straits, £90 7s. 6d. to £90 17s. 6d. ; Australian, £90 10s. to £91 ; English ingots, £94 ; *Lead*—Spanish soft, £12 10s. ; English, £12 15s. ; *Spelter*—Ordinary brands, £17 17s. 6d. to £18 ; special, £18 to £18 2s. 6d. ; English soft, V. & S., £18 10s., Swansea. *Quicksilver*—Importers' price, £9, second hands, £8 16s.

TRADE NOTES

Messrs. Heeley Brothers, of 32, Lambeth Street, Sheffield, who have lately commenced business in electro-plate, have laid themselves out specially for the production of novelties. They are producing a number of beautiful shell patterns, this style being now in the height of fashion. These include, in addition to such goods as sugar and cream bowls and fruit-dishes, a charmingly-designed teapot and a new combined strawberry-dish, which ought to be very popular this season. There are two small shells for cream and sugar, and one raised above the large shell which contains the fruit. The advantage of this happy combination is, says a contemporary, "that the fruit and accessories can be handed round on one dish." Queen Anne teapots and a pretty Queen Anne kettle are also among the current patterns, the taste for Queen Anne goods being as active as ever. Fruit-spoons in cases, and fruit and cake dishes are also being richly chased. In salt cellars, cellarettes, toast-racks, castors, serviette-rings, square or round, and elaborately chased, the firm have a number of pretty designs that are selling well. The same may be said of their bread-forks, and of the light detached frames for butter or other small dishes, of which pattern the senior partner was the originator. In salad-bowls they have some exquisite work in carved oak, as well as in art pottery and glass. Mounted oak and pottery goods, both for salads, biscuits, jelly, jam, marmalade, butter, and other table purposes, are being made one of the specialities of the firm. They are mounting the newest designs from the art potteries, and they are also using the latest productions of Sheffield, in the shape of elegant cases for their various classes of case goods.

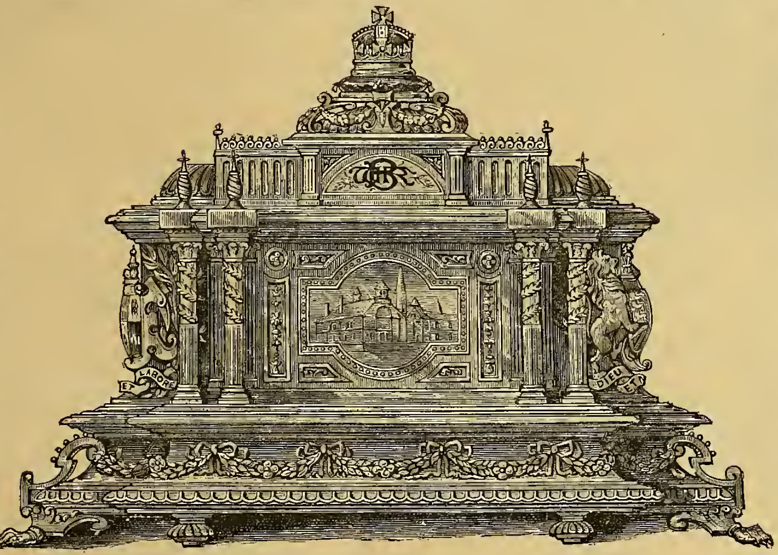
Casket for Lord Dufferin.—The gold casket, made for the Corporation of the city of London, was presented, with an address of thanks and congratulations, to the Marquis of Dufferin, on May 29. The casket, which measures about eight inches by six, is Indian in style and hexagonal in shape, and rests upon a base of ivory, surmounted by a plinth of crimson velvet. The front panel bears in the centre the arms of the Marquis of Dufferin, and on two sides the decoration of the Star of India and the Order of the Indian Empire, emblazoned in proper heraldic colours. The two end panels in the front bear on the left the Order of the Grand Cross, and the right the Order of St. Patrick, also enamelled in proper heraldic colours. The centre panel at the back is the inscription plate. Each of the six corners is supported by pillars, Indian in character. The top of the casket represents the dome of an Indian temple, and surmounting the whole is the arms of the city of London, enamelled in proper heraldic colours. The casket is made in solid 18-carat gold, hall-marked, and was designed and manufactured by Messrs. George Edward and Son, No. 1, Poultry, London, and Glasgow. It may be mentioned that Messrs. George Edward and Son have been successful with their design in obtaining orders for caskets which were presented to Lord Wolseley, the late Earl of Shaftesbury, and Mr. H. M. Stanley, and those presented to His Royal Highness the Prince of Wales and Her Majesty on their visit to Glasgow last year.

The "Gripper" Thimble, manufactured by Mr. James Fenton, of 74, Great Hampton Street, Birmingham, has now been on its trial for some time, and the points of superiority claimed for it over the ordinary silver thimble of commerce seem to be fully borne out by the testimony of retailers who have stocked it since its introduction into the market. As these claims are duly set forth in the advertisement it is unnecessary to recapitulate them here. Another pretty speciality, manufactured by Mr. Fenton, that is worthy of attention is the "Gipsy" Flower Brooch, advertised. These goods are made in a variety of chaste designs, and the well-established reputation of the firm is a guarantee of the quality of the workmanship.

Messrs. John Round & Son, of Tudor Works, Sheffield, have, for the convenience of their friends, published a small pocket edition of their spoon and fork catalogue, and state that they will be pleased, upon application, to supply the trade with a number free of charge for circulation among customers. The catalogue is illustrated with almost every pattern of spoon and fork manufactured, and the price lists are compiled with the usual care and attention to detail, for which this well known firm is celebrated. It also includes revised lists for re-plating and finishing spoons and forks and miscellaneous goods.

Another catalogue and price list worthy of notice is that of Mr. J. Dilger, of 35, Percival Street, E.C. It comprises a complete list of all the tools and materials used by watchmakers and jewellers, together with a price list of watch repairs, &c. It is put together with obviously great care (all the prices and references being perfectly clear) and is copiously illustrated.

Messrs. P. Vaughton and Sons, 193, Great Hampton Row, Birmingham, whose productions we have more than once had occasion to favourably comment upon, have just completed some jewels for the Stewards of the North and East Yorkshire Educational Fund, which are worthy of notice, not only from their high-class workmanship, but also from their uniqueness, of 110-silver, strongly gilt, and 20-bronze, respectively. The design is a raised garter, encircling the arms of the Board of General Purposes which are embossed in high-relief on a domed circle. The garter contains the inscription, "North and East Yorkshire Educational Fund," and the five-pointed masonic star, both the letter and star being raised and lapped, showing the bright silver through the gilding, and producing the effect of bright silver on a dead gold ground. The jewel depends from the bar at the end of a ribbon of light and dark blue silk. On the bar is the word "Steward" in raised, bright letters, and in the centre of the ribbon is a gilt shield on which are embossed the arms of the city of York. Altogether, the whole forms a most artistic and effective arrangement.



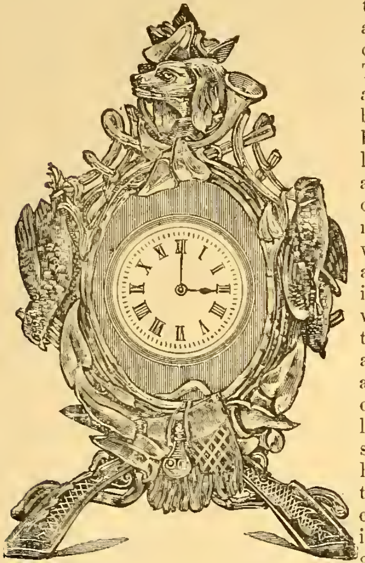
The Improved Patent Collapsible Drinking Cup, manufactured by Messrs. C. Timings & Sons, of Birmingham, which we noticed on its first introduction to the market, has been made still more useful to tourists, cyclists and others, by the introduction of a compass let into the case which adds to both its appearance and usefulness. Another important addition to it is the foot on the bottom of the rings, which makes the cup firmer and prevents the rings from falling apart. Colonial dealers in search of novelties would do well to ask their English agents to procure samples, as these improvements and additions will ensure for the Collapsible Drinking Cup an increased popularity during the coming season.

The registered "Aftcan Silver" chains manufactured by the same firm have been accorded all the popular favour we predicted for them, in a former notice, on their introduction to the trade. The claim of the manufacturers that the alloy of which these chains are composed would wear well and white throughout has been fully sustained, with the result that wherever they have been given a fair trial with German silver goods, the latter have been discarded by the dealers. As an attractive selling commodity, the manner in which the "Aftcan" chains are arranged (being mounted on velvet cards in one dozen assorted patterns, including the favourite "Graduated Curb," "Prince of Wales," "Newgate Fetters," &c.) gives them an immense advantage over the ordinary run of imitation-silver goods, and as they are really what they purport to be, they should be particularly adapted to colonial markets. To ensure getting the genuine goods buyers should note that the initials of the manufacturers, C. T. & S., are stamped on the swivels, and that every chain has a ticket attached to it, on which is "Registered Aftcan Silver."

Presentation to the Mayor of Trowbridge.—The annexed cut is an illustration of the casket presented to W. R. Browne, Esq., Mayor of Trowbridge, by the Duchess of Albany, on the occasion of the opening of the Town Hall. It was designed by Mr. E. Whitmarsh, jeweller, Trowbridge, and was made by Messrs. B. H. Joseph & Co., of Birmingham and London,—in their manufactory in Birmingham. It is hardly necessary to say that the firm who can turn out such a beautiful and artistic piece of work is capable of supplying any article of jewellery or plate in which delicacy of workmanship, artistic design, and softness of finish are the leading features. The style of the casket is *renaissance*. It is silver-gilt, richly embossed and engraved, and rests on six carved feet. The cover is supported by pillars richly embossed with wreaths of ivy in gold round them. The front panel shows a view of the Trowbridge Town Hall in *repoussé* work, oxydised silver, very beautifully executed. The two ends bear respectively the Royal Arms and Mr. Browne's armorial bearings, richly enamelled in proper heraldic colours. On the back of the casket the old castle of Trowbridge with its seven towers, is represented in *repoussé* work, oxydised silver. The top of the casket is very richly mounted with a royal crown on a cushion resting on a dome supported by pillars. Mr. Browne's monogram is shown on the panel of the lid in enamel. The lid is hinged. The whole is a work of art of which both the designer and manufacturer may be justly proud. The following inscription is engraved on a silver plate which is placed on the plush of the velvet base:—"Presented to W. Roger Browne, Esq., J.P., C.C., by his fellow townsmen, on the opening of the Town Hall, Trowbridge, by H.R.H. the Duchess of Albany, June, 1889."

The firm of Messrs. B. H. Joseph and Company, 20, Frederick Street, Birmingham, is one of the largest houses in the jewellery trade. They employ at the present time over 250 workmen, and their manufactures comprise: diamond and gem work of the highest class; all kinds and classes of gold-work—18-carat, 15-carat, and 9-carat; silver ornaments for ladies' and gentlemen's wear; silver requisites, such as toilet services, vases, cups, children's rattles, and even such small articles as thimbles. Their manufactory is situated, as above, in the heart of the manufacturing district of Birmingham, and their branch houses, in London, at 29, Ely Place, E.C., and in Madrid, at Preciados, No. 35. Merchants visiting any of these cities would do well to give them a call.

Messrs. H. J. Cooper & Co., of 150, Oxford Street, are a firm thoroughly impressed with the necessity of taking time by the forelock in all things relating to the conduct of their business. Thus, any novelties that are from time to time brought out are certain to be found among their large and tasteful stock, almost as soon as they can be said to be on the market. On a recent visit of inspection to the above address, among an inexhaustible variety of watches and jewellery of the latest patterns, our attention was particularly attracted by some pretty clocks suitable for travellers. The annexed cut shows one of these we have selected for illustration. It is an eight-day clock with a highly finished French movement, going in any position, and its cheapness should make it command a ready sale.



BIRMINGHAM
NEWS

From Our Correspondent.

The summer season being now fully here, the jewellery trade is resting from its labours; this is a blessed state of affairs for the weary brain and for the possessors of funds, enabling them to emigrate to the "bleached margin of the sea," but to the pushing and energetic business man, not too largely favoured with spare cash, it has its drawbacks. The beautiful weather that prevailed during most of the month of June has had the effect of sending visitors to the various sea-side resorts earlier than usual, and repairers here report that they are receiving parcels of repairs from the various retail houses in the watering places much earlier than usual; the repairing community are consequently landing the fine weather, and indeed, the whole of the trade are looking forward cheerfully, as there are numerous evidences of a coming time for jewellery, and no doubt orders for the winter's stocks will come to hand sooner this year than has been the case for some time past.

* * *

The makers of silver chains, alberts, &c., report a sensible dimunition in the number of orders coming in and every evidence is to be seen of an impending change in the fashion. In consequence of this, some of the makers are putting their hands upon other work, excepting in cases where the plant is simply laid down for making chains, and a change in the goods produced means a considerable outlay in new tools, &c., as well as the ability to " turn one's hand " to a new departure.

Diamonds and pearls continue in favour with our fair sex and seem to be especially in favour at marriage ceremonies. Miss E. M. Foster, eldest daughter of Sir Walter Foster, M.P., was married on June 13th, 1889, at Edgbaston Parish Church, Birmingham, to Mr. E. O. Fordham, of Cambridge, on which occasion she wore a diamond and pearl brooch, the present from the Ilkeston Division Women's Liberal Association. The wedding presents were very numerous and costly, and included a coral brooch from Mrs. W. E. Gladstone; here is a precedent for the wearers of coral jewellery. I hope the ladies will make a note of it and purchase early, as coral of a pale pink colour is "on the rise" and will be the fashion.

* * *

In an interview with Mr. Garduer, the works manager of the English Watch Company, he informs me that trade continues brisk and is on the increase; the demand for their watches is increasing as it naturally does for all good articles at popular prices. They have just secured a contract to supply a large quantity of watches for the Indian State Railway. This fact, I think, speaks volumes, as we all know the accuracy required in a watch used by railway officials, and also the severe tests they are subjected to before placing orders. In consequence of the increasing prosperity of the company, they have been able to give the whole of their employes a rise in their wages. For some two years past they have been subjected to a discount of 5 per cent. from their earnings; the new manager (Mr. Gardner) has now succeeded in removing this which is equal to an increase in prices paid for work. Mr. Gardner is also getting out a new keyless watch which, I understand, will come cheaper than those now made by the firm; and I already hear a number of queries as to when the same may be expected in the market, so it is evidently destined to supply a much-felt want.

* * *

The various out-workers connected with the jewellery trade here are from time to time entrusted with valuable and costly pieces of work, and manufacturers have felt them to be safe while in their hands; they are a class of tradesmen and workmen who have a good name for honesty and carefulness—I mean such branches as case makers, gem setters, engravers, &c. The case maker is often entrusted with pieces of finished diamond and gold work worth large sums of money. The gem setter often has diamonds, &c., in his possession, belonging to manufacturers, amounting to perhaps hundreds of pounds, and the confidence hitherto existing between the manufacturers and the out-workers has been implicit, and I don't remember an instance of it being broken, until the one brought to light, on June 20th, when Ebenezer Sadler, of Vyse Street (late of 9, Pitsford Street), jewel case maker, an old and trusted artificer in this line, was arrested for pawning jewellery. The case was as follows:—The prisoner obtained five lockets from Mr. Taylor, jeweller, Great Hampton Street, and immediately proceeded to pawn them; three with Mr. Davis, Smallbrook Street; and two with Mr. Carter, Aston Street. When he was arrested a search of Sadler's premises was made, which resulted in finding between 30 and 40 pawn tickets relating to watches, bracelets, and other articles of jewellery, so that the misconduct is considerable and probably has been going on for some time. This is much to be regretted as prisoner has held a respectable position in the trade here, and such proceedings greatly tend to destroy confidence. A remand was asked for and granted, bail being allowed, the prisoner finding £50 and two sureties of £25 each.

* * *

A few changes of address have taken place during the month. Mr. A. Butler, jeweller, has removed from 25, Spencer Street to 38, Spencer Street, Birmingham. Mr. A. Downing, pencil case maker, from 28, Hockley Street to 29, Spencer Street. Mr. Moses Lovenberg, jewellery factor, a much respected business house, has departed from among us and closed his premises at No. 17, Vyse Street, for what, I presume he considers " more convenient diggings" at 52, Hatton Garden, London.

SHEFFIELD NOTES

From Our Correspondent.

The "smoke nuisance" is exercising public opinion to some extent just now. We are beginning to believe that it is not absolutely necessary that we should continue to tolerate this infliction. The traveller who passes through Sheffield on the Midland Railway carries away with him a fearful impression of the place, especially if he enters the town from the north. It has been described as a "God-forgotten" place, and it certainly looks as though another potentate had us in his especial remembrance. Now although we are not quite as bad as we look from the outside we are bad enough in all conscience. We have our smoke inspectors, it is true, but their principal duty seems to be to present periodical reports. They have certainly been known to come down upon an offending chimney, but the result has not been such as to stimulate their zeal. The stipendiary magistrate, who himself lives at Norton, is fond of pointing out that it would be useless to convict that particular chimney, as there is one quite as bad in the next street. Nevertheless we really feel as if we could not tolerate this state of things much longer. At all events that is the impression one gathers from a cursory perusal of the newspapers.

Some time ago a firm in the electro-plate trade made an inquiry of the Sheffield Electric Light Company as to the feasibility of "power" being supplied from the company's dynamo for plating purposes. The reply, as might have been expected, was not encouraging. The idea, however, is a novel one and some time or other may lead to something. In the meantime the inquiry shows a somewhat hazy notion of the properties of electricity on the part of people whose interest it is to know all about it. The firm in question evidently thought that the existing electric light circuits could be utilised for their purpose. This however is not the case. The quantity and intensity of current required to light an arc lamp is by no means the same as is required to deposit silver. When it is considered that even an incandescent lamp cannot be worked on the same circuit as an arc lamp, it will be seen how small are the chances of so different a process as electro-plating being so worked. The whole matter has evidently originated in some failure in the plating shop. From the careless manner in which wires are sometimes run in factories I am not surprised at such failures occurring. For example, a wire is run under the flooring of a workshop, under the ostrich-like idea, that being out of sight it is out of danger. But some time or other a nail is knocked in in close proximity to it—or water percolates through the boards—or a hundred other things may happen—and the current becomes "short-circuited," with diastrous results in the plating vat. The plater who may know a great deal about plating solution and the process of plating, but very little about electricity, then "gets the sack," and another is appointed who knows just as little. There is room for a good deal of "technical education" in this department of most electro-plate manufactories.

An interesting gathering took place the other day in the Artillery Drill Hall, in connection with the coming of age festivities of two of the members of the Dixon and Fawcett families, of the firm of James Dixon & Sons, Cornish Place. The workpeople, to the number of about 700, were entertained to dinner by the firm, and the occasion gave rise to a most interesting history of the origin and progress of the works by Mr. J. W. Cunningham, one of the managers. The members of the Dixon and Fawcett families are now awful bigwigs—living in ancestral halls round about Sheffield—the ancestors being bought with the halls, of course. If old "Jimmy" Dixon had no ancestors, the present generation of Dixons—which is the third or fourth—have. Since the early years of the century when the business was founded, the family has given Mayors and Master Cutlers to the town, and served it in various other dignified capacities. There is a tradition among the workmen, that when old "Jimmy" first bought Page Hall, some poetic wag wrote beside the gateway—

"Who would have thought it,
That Teapots had bought it."

Another tradition records how these same teapots were introduced into the market. A man dressed like a "flunky" was sent round to the shopkeepers to ask for one of Dixon's teapots, and—in the words of the quack advertisements—to see that he got it. Of course he did not get it, as nobody had heard of Dixon's teapots, but acting up to the spirit of his instructions, he would "take no other." These, and a host of similar legends are none the worse for being possibly not true, but the sober narrative of the rise and progress of this gigantic concern as told in the Drill Hall constitutes in itself a "strange eventful history."

The electro-plate trade of Sheffield seems to be tolerably well represented at the Paris Exhibition, although many of the principal firms don't exhibit. There seems to be a growing idea that exhibitions are played out, and the firms who do exhibit don't care about showing anything very original. It was all very well at Melbourne where there are as yet no trade rivals, and where there is a rich general public ready to buy. The firms who exhibited there were not long in reaping the fruits of their enterprise. But with Paris it is different. In excellency of workmanship, and adaptability to the needs of everyday life, we can hold our own, but it does seem hopeless for us to attempt to emulate a certain nattiness of execution and gracefulness of design which characterises French work. To show the French how to make not only a graceful but a serviceable teapot seems to a good many people poor policy, and so they won't do it.

I have not as yet seen the present Exhibition, but many years ago I remember forming one of a party of young silversmiths who visited a former big show in the French capital. Our unanimous verdict then was that the best English was equal to the best French work—that is to say we thought Elkington as good as Christophel. But as for articles of common use it seemed to us impossible for a Frenchman to make an ungraceful combination in design, and this was more than we could honestly say for English work of the same class. Things have improved very materially with us since then, but the standard of public taste will have to be raised considerably even yet before things are as they ought to be. As soon as it becomes clear that ugliness won't pay, manufacturers will cease to produce it.

It does not take much in the way of art to satisfy a cricket club, or for the matter of that the crack shots of a rifle corps. The season of athletic sports is once more at hand, and according to custom the prizes to be awarded to the successful competitors are exhibited in the window of some prominent tradesmen in the centre of the town. Most of the articles are doubtless often given by friends of the club or corps as the case may be, and, on the principle of not looking a gift horse in the mouth, should not be too severely criticised. But the principal prize is usually got up with some attempt at appropriateness to the occasion, and as from its ostentatious display it seems to challenge criticism, it surely ought to have it. These remarks are suggested by a wonderful specimen of silversmith's handiwork exhibited in a shop window in High Street. It has something to do with a cricket club because the two handles of the cup, vase, or whatever it is are composed of two sets of stumps, while another set decorates the top with a cricketer swinging his bat in front of it. Far better than this sort of thing is the copper kettle which the public house angling club gives to its successful candidate for piscatorial honours. A copper kettle is a very commonplace utensil, but nobody grins at it through a plate glass window.

The coal crisis concerns the heavy trades of the town more than it does those with which we have specially to do. Nevertheless, as the price of coal is a serious item in the expenses of any manufacturing concern, it is satisfactory to be able to record that the crisis is past for the present. The colliers who demanded a ten per cent. advance have obtained five with the promise of another five in October. The worst of it is that if the improvement in trade continues next winter, fresh demands are sure to be put forth and conceded until ultimately the goose that lays the golden eggs is killed.

In the meantime silversmiths continue busy in spite of the fact that we have reached the season of the year when orders usually fall off. The leading firms continue to do most in the more expensive class of goods. I heard the other day of a house which supplied a cabinet to order, fitted up with the usual articles, for close upon £300. An abnormal amount of silver is now being made up, a sure indication that the country at large is prosperous. As for the heavy trades—trades which so recently as eight months ago were almost looked upon as played out as far as Sheffield is concerned—they have never been so prosperous for years. And this, altogether apart from the large government orders for armour plates which are coming in, in connection with the new scheme of naval defence.

Midland Jottings.

By W. K. P.

BUSINESS men both privately and on 'change are remarking on the improved prospects of trade in the Midlands. There is scarcely a department in which some decided improvement has not taken place during the last few months. Consequently manufacturers and merchants are ceasing to look so "blue" and are declaring indeed that things are looking quite "rosy." There seems to be a decided lull in political strife, and the rumours of war which so easily escape from Continental diplomatic circles are for the time stilled, and a general feeling of greater security is coming over things. Six months ago people said "there will not be a Paris 'Exhibition,' but a 'Revolution.'" There has not been a Revolution, but the exhibition is a very palpable fact indeed. The jewellery trades are well represented there, and experts have issued their reports on this portion of the great show. Not to stray too far afield however, this month my jottings will be concerned with the Electrical and Industrial Exhibition in Birmingham, which I mentioned incidentally in my last month's notes.

The Exhibition has assumed quite large proportions, and even now there is quite a clamour for space, which however cannot be allotted as the whole of the available room at the disposal of the Committee has long since been disposed of. The Exhibition will be opened on August 1st, and there will be nearly 300 exhibitors The industries represented will be very varied, for though primarily it is an electrical exhibition, there are so many trades which are now intimately connected with electric power. There are several exhibits too which are not connected with electricity at all, but which are admitted on account of their interest to the general public. Every effort is being made to render Bingley Hall an attractive resort. Fountains illuminated with various kinds of electric light will play nightly, and with them also will nightly play the military bands which have been engaged. Season tickets at half-a-guinea each are being issued, and it is expected the whole thing will become very fashionable.

In the watch and clock trade Messrs. Swinden & Sons, of Temple Street, Birmingham, are exhibiting watches and clocks of various descriptions as well as watch and clock tools for which they are noted. Messrs. G. and F. Wattis, of Lower Temple Street have an exhibit including English and foreign clocks; French dining and drawing room clocks: German and French mechanical clocks in action; chime and electrical clocks: non-magnetic watches, and English, American and Swiss watches. Austrian regulators for entrances to halls; American wood-case timepieces and nickel plated alarums.

There are several exhibits of jewellery, though for some reason or other, not by local firms. Mr. Zachari Tahan, of West Kensington, will display some Roman mosaics and various kinds of oriental goods and jewellery, and Mr. A. Alonzo, also of West Kensington will have a similar exhibit. Mr. Albert Brunet, of 28, North End Road, London, S.W., will display an assortment of fancy goods and Parisian jewellery, including some pretty double chains in oxidised silver. Mr. B. Wareing, of Northwood Street, Birmingham, will have a display of steel bead ornaments, hair pins, brooches, hat pins, watch chains and bracelets. Messrs. H. Jenkins & Son, of Vittoria Street, Birmingham, will show medals and badges and ornamental stamped and pierced goods. Messrs. Tenetus Bros., also of Vittoria Street, will exhibit a varied assortment of electro-plated goods. Messrs. W. and T. Avery, of Birmingham, exhibit bullion and other sensitive balances; and Mr. Snelgrove, electrical weighing machine as well as other articles registered by this firm due to the prolific mind of Mr. Snelgrove.

Mr. W. Stenning, of 105, Sydney Street, London, S.W., will display a selection of pen and pencil cases in bone, aluminium, nickel and other metals, and the process of manufacture of pen and pencil cases. He also exhibits a patent attachment for bottles, jars, &c., for holding spoon, fork or other server of the contents thereof. Mr. A. H. Woodward, of the I.X.L. Works, Vittoria Street, Birmingham, has also a case of pens, pencil cases, penholders, and his patent automatic cigar cutter, and in addition, a hand machine for ornamenting pencil cases, &c.

In the optical trades there are some extensive exhibits. Mr. Frederic Marshall, of Hastings, will show graphoscopes, stereoscopes and stereoscopic slides, reading glasses, spectacles, milk testers and linen provers; field, marine, and opera glasses; telescopes, barometers, thermometers; microscopes and microscopic slides, both opaque and transparent, mounted objects, spot lenses, polarising apparatus, powers, &c. Messrs. Wattis have in this department, aneroids, for pocket, and other barometers, marine, opera, and field glasses and measuring instruments. Messrs. J. A. Reynolds & Co., of Colmore Row, Birmingham, have a display of mathematical and optical instruments including prismatic compasses, anemometers, etc. Messrs. Chas. Smith & Co., of Icknield Street, show their patent combination compasses, reading glasses and hand mirrors, card cases in the new material, zylonite as well as all kinds of propelling pencils in nickel and other metals. Messrs. J. & H. Taylor, of 49, Tenby Street, show photographic cameras, and general optical goods, as does also Mr. E. J. Adams, of 84, Great Hampton Street, whose specialities are eye glasses, photographic apparatus and spirit levels. Other exhibitors of general optical goods are Mr. James Stewart, of West Kensington and Mr. J. H. Dart, of Kensington.

As regards the electro-plate trade, this is not so well represented as it should be. The wares are always an attractive feature at an exhibition, and it is a pity there will not be more of it to be seen. Some good exhibits will be included however, which comprise the patent pickle forks, sugar tongs, sardine servers and fish knives, as well as all kinds of E. P. goods of Mr. James Bolting, of 30, Richmond Road, Brighton, and Messrs. Seaton & Stanley's, of Bristol, "Perfection" patent pickle tongs, sandwich servers, sardine servers, and pen and pencil cases, in nickel, aluminium, &c.

Among the most interesting exhibits which might be termed accessory trades to the electro-plating and jewellery industries are those for electrical deposition of metals and all the many things needful in this process. Messrs. J. E. Hartley & Co., of

St. Paul's Square, Birmingham, exhibit dynamos for this purpose and improved Bunsen batteries for the dynamos, electroplaters' chemicals and apparatus, and they will illustrate gilding, silvering and nickelling by electric deposit. They also show their new celluloid and cold lacquers, and an exhibition of silver-plated and brass articles coated with this material. Messrs. W. Canning & Co., of Great Hampton Street, display dynamos, vats, chemical solutions and all requirements for electrical deposit, as does also Mr. Richard Cruickshank, of Camden Street, whose exhibit includes regulators, switch-boards, indicators, &c. The Corporation of Birmingham exhibit through Mr. Prime the original dynamo for depositing metal.

Among the miscellaneous exhibits may be mentioned Messrs. Benton & Johnson's, of 63, King's Cross Road, London, gold and silver ware threads, braids and embroidery, and Mr. John Butler's, of Aberdeen, which consists of the process of engraving on metals—crests, monograms, autographs, and all armorial bearings.

Diamond Cutting.

AMONG the places of interest thrown open to the inspection of the civil, mining, and mechanical engineers of America now on a visit to this country, are the diamond mills of Messrs. Ford & Wright, in Clerkenwell, situated close by the Middlesex Sessions House. Long ago in the 17th century, London was one of the chief seats of the art of diamond cutting and polishing, but the industry was subsequently lost to the metropolis, and became centred in Amsterdam. Efforts, however, have of late been made, with gratifying success, to revive the industry here, and foremost amongst the workers to this end has been the firm of Messrs. Ford & Wright. At their works the process of diamond cutting and polishing is carried on most successfully by English workmen, who, it has been shown, can in point of skill hold their own against any others. A visit to the diamond mills reveals much that is noteworthy, and the American engineers, and especially the ladies of their party, cannot fail to be interested in what is there to be seen. In the gems themselves the ladies will perhaps take most interest, but in the machinery mechanical engineers will find something worthy of their professional attention. There is, in fact, in operation an entirely novel mode of high speed driving, designed by Sir Henry Bessemer. The name of Sir Henry Bessemer is known and respected in America no less than in this country—indeed, the name of Bessemer has been bestowed on two rising cities of the iron districts of Illinois and Alabama—and Sir Henry Bessemer, who is the grandfather of the junior member of the firm of Ford & Wright, was present last month to greet a contingent of the American visitors who came to inspect the diamond mills. Diamonds both in the rough and polished state are shown in great variety and different sizes. Some pieces of hard blue limestone, with diamonds embedded, show the original state in which diamonds are found at the Cape. A number of large diamonds are to be seen in the rough state, one of 90 carats, but in the process of cutting and polishing a stone loses more than half its weight. Beautiful white diamonds of good size, remarkable for their brilliancy and purity, are worth about £25 a carat, while the price of some small brilliants is as low as £6 to £7 a carat. The operation of cutting and polishing diamonds, the hardest of all known substances, demands a large amount of skill on the part of the workmen. Diamond is used to cut diamond, and with regard to the first process of cutting, two diamonds are mounted on sticks or holders. The operator, taking one in each hand, uses an angle of one gem to cut off or reduce the angles of the other, and in this way the natural angles of the stones are removed, the dust being caught up for subsequent use. Afterwards begins the process of cutting and polishing, carried out in the mills by steam power. The diamond to be cut is mounted in solder contained in a brass cup at the end of a piece of copper wire, which is held in tongs on the mill disc. The revolving disc is charged with diamond dust and oil, presenting, so to speak, a diamond surface upon which the diamonds, soldered in a cup, are cut and polished. The mills run 2600 revolutions a minute. The high rate of speed of working gradually wears away the stone being cut, and when the workman considers that the cutting of a facet has proceeded as far as is required the solder is softened and the gem released ready to be again set in another position to be placed in the mill. The cutting thus proceeds by successive stages till the jewel finally assumes the proper form. Many valuable stones were in course of being cut, partly for the edification of the American visitors, one being a large white diamond of 26 carats, and it was stated that one skilled workman had £1000 worth of precious stones on his bench. The glittering jewels thus produced are superbly mounted in every variety of form, from the simple necklaces to the aigrette or royal tiara.

The Birmingham Jewellery Trade.

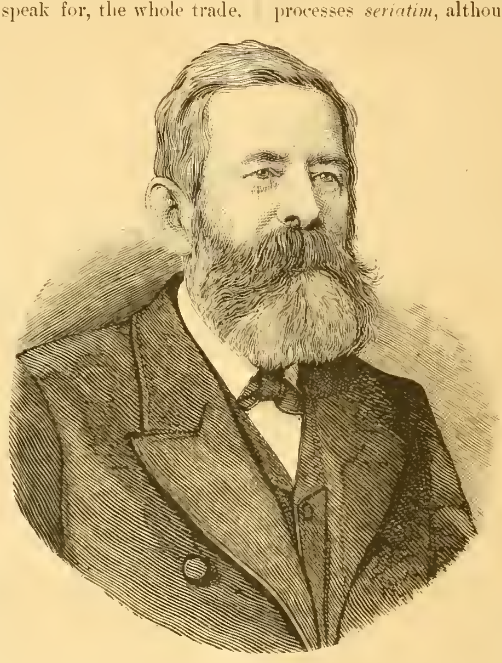
IN an article on trade and commerce, the *Birmingham Daily Gazette* says that the jewellery trade shows rather more vitality than is usual at this time of the year. This is principally owing to the activity of shipping, business indents being more plentiful for Australia, New Zealand, and South Africa. Orders for export, however, are chiefly for the cheaper classes of goods, though they find a considerable amount of employment. Home orders represent a fair average, notwithstanding that the holidays and the exodus to the seaside have interfered with the demand for jewellery to a considerable extent, whilst the London season is also over for the present. There is a brisk inquiry for special goods and presentation pieces of the best class of workmanship. Prices are still low and comparatively unremunerative in consequence not only of the severe competition, but the large bankrupt stocks which have been thrown upon the market, and are being retailed in many cases at less than cost price. The quick changes of fashions prevent wholesale and retail dealers from ordering large quantities of any particular styles of stock, and consequently business is of a hand to mouth character. At the same time the influx of orders at the leading establishments is tolerably regular. In gold work there is a conspicuous return to the styles prevailing during the French empire and ancient monarchy, Louis XVI. patterns in brooches and bracelets being in much favour. Messrs. T. and J. Bragg are taking the lead in this direction, and are producing gold brooches enamelled in various colours, and fitted with diamond centres, presenting a very artistic appearance. These goods may be described as an Anglicising of the old French styles. Other houses are also introducing different varieties and combinations which are meeting with public favour. A large trade is doing in cheap gold bangles and bracelets, but at prices which are hardly remunerative. The silver department is gradually improving, but the demand is mainly running on fancy pieces of novelties, such as chatelaines and other appendages to ladies' dresses ; also salts, mustards, spoons, pepper boxes, jewel boxes with elaborate silver-ornamentation, and the like. Many jewellery houses have given up making personal ornaments, and are now trenching upon the formerly distinct branch of the silversmiths. Messrs. T. and J. Bragg are now engaged on a magnificent gold key for presentation to Prince Albert Victor of Wales on the occasion of the opening of the new wing of the Bath Hospital at Harrogate early in July. The key is executed in the Rennaissance style. The head of the key on the obverse side is surmounted by the arms of Prince Albert Victor, and on the reverse side are the arms of Harrogate, with the Esculapean staff. The key is further decorated with foliated mouldings and rich capitals.

Half-Hours with our Manufacturers.

I.

THE popular idea that the English watch trade is losing ground and that our home manufacturers have not been going with the times by adopting the best systems and methods of production would be speedily changed, could the persons holding it pay a visit to one of our modern watch factories at present in full work at any of the principal centres.

The belief that English watchmakers have not been keeping pace with foreign producers is, however, not altogether confined to the public. Its constant iteration by those, who, by taking the trouble to inform themselves on the subject, would know better than to repeatedly express it, has to some extent reacted on the remoter portions of the trade itself, and it is not uncommon to find men (mostly of little account) who have been experiencing bad times, shaking their heads mournfully over the decadence of the trade as a whole; as if they had any knowledge of, or right to speak for, the whole trade.



AUGUSTE GUYE.

Want of cohesion among the smaller craftsmen and retailers—of "touch" with their own trade—coupled with the indifference or innate diffidence which characterises our manufacturers (the latter being, perhaps, a national trait, at all events, in watchmakers) is the most apparent cause of the prevalence of such an unfounded notion, and there can be no doubt that had manufacturers awakened earlier to the fact that hiding one's light under a bushel is bad policy, their opponents would not now occupy the relatively favourable position in the public estimation they do.

We, in our small way (the scope of this journal being strictly limited to trade circles) have done our best to refute the misleading statements of scientific men (in other branches) and others on the subject of watchmaking, and have entered our protest from time to time against the fatuous passivity of English watchmakers under the charges of effeteness levelled at the trade as a body, and, in some instances we have been able to trace, have had the satisfaction of knowing that our remarks have reached the quarter they were intended for.

But it is only the trade, the whole trade, and nothing but the trade, who can by properly asserting themselves, put themselves right before the great buying public. To this end it is indispensable they should know what our manufacturers are doing.

Retail watchmakers and jewellers, and dealers, unable to visit the larger manufacturing centres, will, therefore, we trust, find the contemplated series of "Half-hours with our Manufacturers" of some interest as well as of service to them in the direction indicated.

As pertaining to the first title of the *Watchmaker, Jeweller and Silversmith*, it requires no apology to the other branches with whom we are concerned that we begin the series with "watchmaking," and, in like manner, it is fitting, as the premier factory in point of age, that we first visit the London firm of

Messrs. P. & A. Guye.

Unlike some of the latest additions to the watch factories of abroad, which have been "boomed" and sprung into existence "like mushrooms, in a single night," Messrs. Guye's factory is the outgrowth of small beginnings and the unremitting perseverance and enterprise of the head of the business, Mr. Auguste Guye; from Guilford Street 30 years ago, to Northampton Square, where some of the finest watches ever manufactured in Clerkenwell were constructed for the American market; thence to St. Bride Street, E.C., where the present system of manufacture carried on by the firm was instituted; and, from thence, to the premises now occupied, which are situated on the western side of Farringdon Road, close to (on the opposite side of the road) the Metropolitan Railway Station.

Thirty-five years of steady progress have marked the course of Messrs. Guye's connection with the watch industry, of which the factory under notice is the result, with practically unlimited possibilities of further development.

The workshops, having a superficial area of 3,300 square feet, occupy the top floor of the spacious building, and are lighted from the top and sides. When we entered, accompanied by the courteous principal, we were somewhat exercised as to where to commence our detailed inspection. However, as Mr. Guye was evidently unaccustomed to the usual methods of exploitation, we elected to begin at the beginning, and go through the various processes *seriatim*, although want of space will only permit of a bare summary of what we observed.

Making our way towards the engine room, we were at once struck with the superior appearance presented by the employées (upwards of 100 in number) at work. This we found to be explainable from the fact that they are all skilled operatives, and not merely machine-minders.

Messrs. Guye are not, by the bye, the only manufacturers who have come to the conclusion that unskilled labour in machine watchmaking is a mistake, the difference in wages being fully made up in the latter case by the breaking and spoiling of tools and materials. Roughly speaking, the work carried on in this factory may be divided into four sections; although the processes enumerated in each, are classified more for our own convenience of description than from each having any immediate connection with the other *per se*.

Thus, what we shall term group No. 1 includes movement making; lever and pallet making; case polishing, and engine-turning. In group No. 2 are pivotting; keyless work, pinion and screw making. In No. 3 are boxing-in, finishing, and examining. While No. 4 comprises escapement making, and springing and timing.

The movements, which are of the special calibre designed by the firm, which allows of the same sized wheels, pinions and escapements in three different sized movements, are produced by machinery from beginning to end. First, the rough blanks are pressed out; then turned to shape and size and the sinks turned out; the pivot and screw holes and seats for jewelling are turned and drilled automatically, and the screw holes tapped in a tapping machine; the latter processes being mostly all done without necessitating the removal of the plates from the machines. The machine for drilling the screw holes for jewel settings is an especially ingenious arrangement, as is also that for turning out the barrels; the latter has double action cutters, by means of which the back and front of barrel are turned in the one operation, while the former, which like most of the machinery employed in the factory, is, we believe, due to the genius of Mr. A. Guye, whose scientific and mathematical attainments and their application to horology are well known in the trade, ensures interchangeability of the jewel settings.

Messrs. Guye particularly pride themselves upon the interchangeability and finish of their escapements. These are made entirely in the elaborate machinery which is the speciality of the firm, no handwork whatever being expended in the production of the various parts. Absolute accuracy to within $\frac{1}{2}'$ in the angles of pallets and levers is ensured automatically, and further adjustment in putting the escapements together is practically unnecessary.

Of the quality of interchangeability of these escapements we have had ocular demonstration, having seen one taken out of one finished watch and put into another without any alteration being required, this in itself being a triumph of mechanical art.

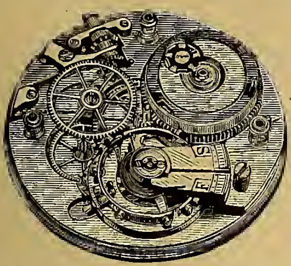


Fig. 1. MOVEMENT OF WATCH WITH TOP PLATE REMOVED.

The cutting of wheels and pinions, keyless wheels, &c., leaves nothing to be desired either in the machinery employed (the automatic accuracy of which is assured by means of the latest improvements in stops, always a weak point in automatic machines, and cam actions), or in the work when finished; in fact the accurate shape of the teeth of wheels and pinions (epicycloid and hypocycloid respectively) is not the least excellent point in the watches manufactured by this firm.

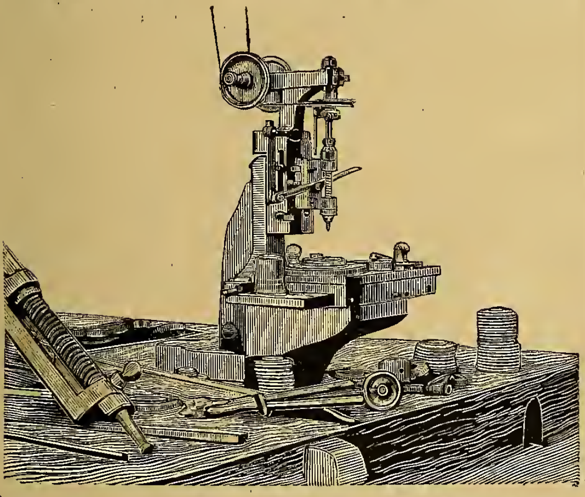


Fig. 2. DRILLING AND TAPPING MACHINE.

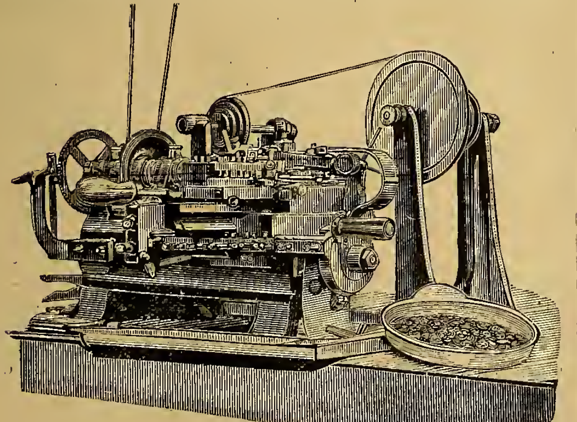


Fig. 3. WHEEL CUTTING MACHINE.

In the pivot and pinion polishing processes, the most noticeable departure is the dependence that is entirely placed upon the improved milling processes, in which the mills rotating in an opposite direction to that of the work being polished, perform, what has always been recognised as one of the most difficult operations to accomplish automatically, with an astonishing degree of accuracy and finish.

Our illustrations are from photographs taken by Mr. Guye, Jun., and give a fairly good idea of the larger machinery used.

Various labour saving appliances on a somewhat smaller scale than the aforementioned are employed in the boxing in, finishing, and examining department; while the finishing of the escapements, springing and timing are done by hand.

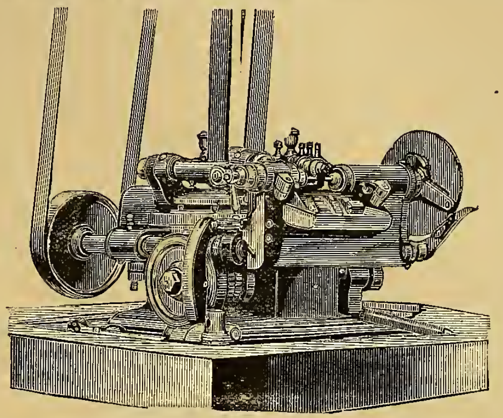


Fig. 4. PINION CUTTING MACHINE.

Altogether there are 80 or 90 automatic machines in constant use; the whole machinery being driven through overhead shafting by a powerful "Otto" gas engine. On account of the limited output (although that limit means a matter of 200 watches a week) the dials and cases are made more economically out of doors. In the machine shop adjoining the engine room, various tools and machinery are made as special requirements in the shops manifest themselves from time to time, and the cutters and tools are kept in order, adjusted and repaired. Great care is necessarily exercised in this department, as any slight wear in the cutters or alteration in the position of any of the stops would often cause considerable waste of material and other troubles before being discovered, otherwise than by the constant delicate gauging processes which are one of the provinces of this shop.

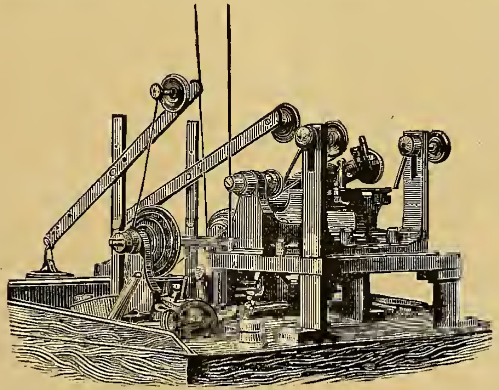


Fig. 5. PIVOTTING MACHINE.

In answer to our interrogations, Mr. Guye says: "Trade is undoubtedly improving. Owing primarily to the immediate action of the Merchandise Marks Act, the demand for English-made watches has been greatly stimulated, and there can be no doubt that, following the general revival of trade, a still further improvement will be felt. Still, too much confidence must not be placed in the protection to the English trade afforded by the Act. The influence of shopkeepers should not be under-estimated; if it suited them to sell foreign-made watches in preference to English, they could in most cases easily do so, and our only chance to prevent competition is to keep down the price."

The Paris Exhibition.

From a Special Correspondent.

THE largest and most varied display is that made by the Goldsmiths' and Silversmiths' Company (registered), 112, Regent Street, W. The best products of their factories at Clerkenwell, Sheffield, Paris, and Belfast are shown, of the highest quality and finish, consisting substantially as follows :—electro-plate, sterling silver, jewellery, diamond ornaments, table cutlery, dressing bags, &c. Although the great concern manufacture watches and clocks, such articles are here conspicuous by their absence. If a page of this monthly could be spared, justice might be done the Company in a detailed account of their magnificent installation, with its massive and glittering silver-ware ; but, that being impossible for lack of space, the reader must be referred to the exhibit itself, if a visitor to the International ; if not, to the sumptuous catalogue issued by the Goldsmiths' and Silversmiths' Company, which like their marvellous stand, contains everything from a simple finger-ring to the heaviest plate.

Adjoining—rather too proximate, in fact—is the smaller but no less worthy show of the Goldsmiths' Alliance (Limited), 11 and 12, Cornhill, E.C. For many years the concern was conducted under the firm-style of A. B. Savory & Sons, whose silver plate and silver-plated manufactures (produced in the factory on Red Lion Street, E.C.), were famous throughout Europe. The Goldsmiths' Alliance exhibit will always have myriads of admirers, particularly from serious *mesdames* and gay *mesdemoiselles*, over their exquisite afternoon tea services, the designs about which are simply superb. It is on table services, in truth, that the combination score highest, shading their other meritorious productions by this one excellence. From asparagus tongs, butter coolers, epergnes, waiters, and crumb scoops, to muffineers, soufflet dishes, and wine funnels, the Alliance, in their goods, maintain the solid reputation founded for them by the first Savory over 100 years ago.

Church, turret, house, and musical clock manufacturers and bell founders, are the words on the card of Messrs. Gillett and Johnston, Croydon, Surrey. As the makers of patent carillon machines they are most noted. A model of one of these appears in the very beautiful and interesting, though not large, case, exhibited in the British section, attracting immediate attention. Then, of additional edification, is the working model of a new automatic ringing machine to represent a band of ringers. Unfortunately, through the absence of either principal, and no one being apparently in charge of the machines, the working of these ingenious mechanical devices could not be seen, so no details can just yet be given on an interesting subject, not only to bellmen, but to clockmakers on a large scale.

Agented by V. Lejeune, 16, rue de la Banque, the firm of Rotherham and Sons, Coventry, make a fine, although not large exhibit of genuine English watches : that they are such is unmistakeably stamped on their very appearance : for it is a thoroughly good and representative exhibit of British work. A better lot of gold and silver watches, of finish *par excellence*, cannot be encountered elsewhere. Then an interesting feature in the handsome case are the 30 or so little plush stands on which rest parts of the delicate mechanism used : ten minutes' study of these enables the expert visitor to get a fair idea of the method of construction and the beautiful work executed.

Messrs. Usher and Cole exhibit marine chronometers, deck watches, and all kinds of gold keyless ladies' and gentlemen's watches; some very fine minute repeaters and minute chronographs, entirely made by Messrs. Usher and Cole ; a keyless chronometer hunter, also a hunter with place for photograph in dome, ladies' watches small enough for wear in a bracelet, some with chased gold faces, and engraved cases. We must not forget some unfinished watches with the repeating and chronograph work made to them. Several of the watches have Kew "A" certificates attached.

English horological literature is represented by Messrs. Tripplin and Rigg's translation of Monsieur Saunier's "*Treatise*" and "*Handbook*," which are exhibited by the publisher, Mr. Julien S. Tripplin, of 5, Bartlett's Buildings, Holborn Circus, who is one of the jurors in the English section.

The three immediately preceding paragraphs are, as this one, in relation to a series of exhibits, all under the one same long case, scarcely breast-high, some separated and some not by wooden partitions. This is the exhibit of the ancient house of Webster, 5, Queen Victoria Street, E.C. (founded 1711), and very trifling for the successor of French, in old days well known on Royal Exchange. Old and new style watches are on view, the latter said to be non-magnetic. But the quaintest item about the case is the following, copied from the *London Gazette*, of 1713 : "Notice of demise of Mr. Tompion, to whom 'William Webster, at the *Dial and Three Crowns*, in Exchange Alley, London, served his Apprenticeship, and served as a Journeyman a considerable Time, with the said Mr. Tompion, and by his Industry and Care, is fully acquainted with his Secrets in the said Art."

It is quite a pleasant relief to now gaze on the miscellaneously made up exposit of the British United Clock Company, of Birmingham and London, manufacturers of eight-day and thirty-hour timepieces and alarums, in plain and fancy cases. In the matter of external decoration it is that the concern achieve most : such manipulation of brass, nickel, copper, silver, etc., cases is not frequently met with. Many of the mountings are especially tasteful.

Very unpretentious is the plain, neat exhibit (1801) of the old-established firm of Parkinson and Frodsham, of Change Alley, at No. 4, Cornhill, who are highly respected in this country as furnishers of the principal maritime companies of France. Not a dozen watches—only a couple of clocks, and three ship's chronometers (placed upright instead of lying flat) constitute the show. But such meagreness counts for nothing ; stand 128 is adorned with the firm's past honours—curiously enough, all in couplets—two gold, two silver and two bronze medals.

Half-a-column would be filled to give a list of the distinctions secured during many years of hard, honourable work by Victor Kullberg, 105, Liverpool Road, London, supplier to the Indian State-Council, the Admiralty, and Crown Colonies. Ships' chronometers, judging by the display, are a feature of the house ; then a handsome, not too big, show is made of clocks and watches. The visiting tradesman will ascertain this assertion correct, that Victor Kullberg's essentially fine case will be found of premier usefulness to inspect.

Octometer is the title applied to an eight-day watch built by Weill and Harburg, of 3, Holborn Circus, E.C. An assortment of such are on sight, the intensely black lettering on dial being notable. This is a petty, yet attractive and edifying exhibit of silver watches and other novelties, including plain, chased and fluted silver cigar and snuff boxes, pocket books and money purses, each having a delicate, tiny watch in one side, of size smaller than a farthing. For presents these articles should take quickly. Represented by Monsieur Harvey, boul'd des Capricines 23.

In concluding his notice of this portion of the exhibits, our correspondent complains of his inability to get more detailed particulars respecting the exhibits, owing to the absence of attendants at the stands. This may perhaps be explainable from the fact that at the time of his visits the exhibits were far from being in a complete state (in common with those of the other portions of the Exhibition) and may be rectified later on ; at all events, it is to be hoped so.—Ed.

The Introduction of the Plate Trade to Sheffield.

AT the dinner to Messrs. Dixon & Sons' employées last month, in Sheffield, Mr. J. W. Cunningham gave a sketch of The rise and progress of the firm of James Dixon & Sons. He said that it had been thought that a brief outline of the history of the works in Cornish Place, from its inception in the year 1804, by its founder Mr. James Dixon, to its present development, when it has business connections with customers in all parts of the world, would be of interest to many who were present that night. It would be necessary at the outset to glance at the introduction of the Sheffield plate trade to the town, as it was the development and success of this trade that caused Mr. James Dixon to undertake the Britannia metal business. The year 1742 was memorable in the history of Sheffield for the introduction of a new manufacture into its midst. It was in that year that Mr. Thomas Bolsover, an ingenious mechanic, when employed to repair the handle of a knife which was partly composed of silver and partly of copper, was struck with the idea of its being possible to unite the two metals, so as to form a cheap substance which present only an exterior of silver, and which might therefore be used in the manufacture of various articles in which previously silver had been solely employed. The process was to cast an ingot of copper of convenient size, then to file the top and under edge true and clean. On these two faces were secured by iron binding wire two strong sheets of clean-scraped silver, a flux being added around the edge. The ingot was then placed in a furnace, and carefully watched until it was seen that the edges of the silver plates were being fused, and attaching themselves to the copper ingot. When this was fully accomplished, the ingot was withdrawn, the iron binding wires removed and the ingot cleaned and passed on to the rolling mill, where the greatest care was employed in rolling it into sheets for waiters, baskets and other articles. Mr. Bolsover did not succeed very well, and it was left for a member of the Cutlers' Corporation—Mr. Joseph Hancock—to show to what copper plated in this new method might be applied, and how successfully it was possible to imitate the most richly embossed plate. He employed it in the manufacture of candlesticks, teapots, waiters, and most of the old decorations of the sideboard, which previously to this time had been made only in silver. Workmen were easily procured from amongst the mechanics of Sheffield, whilst the streams in the neighbourhood furnished opportunities for erecting mills for the rolling of the metals This trade naturally influenced the introduction of the manufacture of sterling silver plate into Sheffield, and in the year 1773 an Act was passed by Parliament which granted an Assay Office to Sheffield. The introduction of these trades into the town caused Mr. James Dixon, the founder of the firm, to form a bold and original idea. This was the manufacture in Britannia metal of the same articles which had as yet only been made in Sheffield plate. This idea was a great one, and when put into practice succeeded. Articles of daily use hitherto made of brittle crockery were soon generally superseded by a metal article more enduring, and, therefore, less costly in the end, whilst the silver tea or coffee pot was relieved from daily wear and tear on many breakfast tables by the introduction of these cheaper and not less efficient substitutes. In the year 1804, Mr. James Dixon, in conjunction with Mr. Smith, commenced business in Silver Street, and the venture proved a success, year after year extra workpeople being required to keep up with the demand for James Dixon's ware. During this period, part of the work was carried on at Cornish Place, where there was steam power. This place had originally been a rolling mill, and the engine was one of the first erected in Sheffield. The engine having been described, Mr. Cunningham proceeded to narrate that at this time the teapots made were mostly of oblong or oval forms, the bodies being stamped in two pieces by rude cast metal dies. They were then shaped with the mallet and hammer into the form required, and put together. For other shapes the bodies were stamped in sections of three, four or six, and then put together. The art of shaping the metal into form by the spinning process was only partially known, and only practised on a small scale. To have spun a teapot body all in one piece would then have been considered a marvellous piece of work. The business still increased and prospered. One of the workmen who was present that night, and who commenced to work for Mr. James Dixon in 1820, had told him that Mr. James Dixon was known to say that when he could keep twenty makers-up going he would be satisfied. Well, his anticipations were exceeded, for in 1823 there were more, and in all the branches together there were nearly 100 people employed. In this year, Mr. William Frederick Dixon, eldest son of the founder, came of age, amidst great rejoicings, an account of which was given, culled from the *Sheffield Independent* of June 21st, 1823. This gentleman was afterwards made a justice of the peace, and appointed a deputy lieutenant of the West Riding of Yorkshire. In the year 1824 the whole of the business in Silver Street was removed to Cornish Place. In the year 1830 the silver and Sheffield plate trade was added to the works at Cornish Place, the business formerly carried on under the title of Nicholson, Ashforth & Cutts being acquired. The number now employed amounted to over 150. About this time Mr. William Fawcett joined the firm, and he most assiduously looked after the new branch of the business, and under his energetic supervision it was greatly extended. Mr. Fawcett subsequently became a member of the Town Council, and was raised to the aldermanic bench in 1851, being elected Mayor in 1855, and whilst in office he had the honour of receiving the gold medal from the then Emperor of the French for the excellence of Sheffield manufactures during that year. In 1863 he was elected to the magisterial bench. Returning to Cornish Place, the speaker found that about 1831 the powder flask trade wss introduced, the business of Mr. Batty, of Tenter Street, being purchased. This caused another twelve men to be added to the employed, under Mr. Thomas Heely, as manager. In the year 1834 Mr. Dixon purchased from Mr. G. B. Greaves, Page Hall, which at that time was considered one of the handsomest residences near Sheffield. In the year following, Mr. James Dixon's second son came of age, but the young man at the time was absent in America, and the rejoicings in celebration of the event took place on his return home. Mr. James Willis Dixon went over to America on six different occasions, and at one time resided there as representative of the firm, and inasmuch as he was a most excellent man of business, he contributed greatly to spread the name and fame of Cornish Place manufactures to such an extent that the firm was placed at the head of the Sheffield houses sending plated goods to the United States. In the year 1836 the nickel silver spoon and fork trade was commenced, the new metal being composed of nickel, copper and zinc. This compound, called German silver proved to be very valuable. It was employed not only as a substitute for copper in the old plating process, but also as a basis for electro-plate. The spoons and forks were at first cast, then ground, buffed, and polished, but the process did not answer, the articles being very soft, porous, and defective. They were then made of rolled sheets, and stamped and filed into form. When this branch was added to the trade at Cornish Place, there were two men employed as filers and only one holloware buffer. Now there were employed in this department alone over 150 people, and additions were made daily to cope with the demand for this class of goods. On the 28th June, 1841, Mr. H. I. Dixon came of age, and in the following year Mr. James Dixon, the founder, retired from business. He was presented by the workpeople with a sterling silver service of plate, valued at £1000. On June 13th, 1846, Mr. W. F. Dixon, Jun. came of age, and the event was celebrated with great joy at Birley House. Mr. James Dixon's coming of age, its celebration at Stumperlow Hall in October, 1872, his election as Master Cutler in 1887, with the presentation made to him in honour of that occasion, were events within the memory of most of them. He must not omit to say that during the period just sketched great progress had been made in the artistic merit of all the various productions at Cornish Place. The firm sent an assortment of their manufactures to the first great International Exhibition at London in 1851, and it was recorded that their exhibits of Britannia metal so resembled silver that the authorities recommended them to inscribe the words "Britannia metal" on the cases, so that the goods might not be taken for silver. At this Exhibition the firm received two prize medals, and awards had also been made at the following exhibitions: London (1851), Paris (1855), Akola, India (1868), Chili (1875), Sydney (1878), Melbourne (1880), Calcutta (1883). In conclusion, he was pleased to say that at the present time the pressure of orders for the various articles manufactured by James Dixon and Sons is so great that it was taxing all the efforts of the willing staff and workpeople to cope with them. The present celebrations in honour of the coming of age of Mr. L. B. Dixon and Mr. E. D. Fawcett was another instance of the cordiality of feeling existing between the firm and their workpeople, and he trusted that that personal regard between employers and employed would ever be predominant at Cornish Place. If those two worthy young gentlemen would only watch the course of events and adapt the means of production to the necessities of the time they would hold their own. He hoped the introduction of the easiest and most economical methods of making beautiful articles would be their constant study, and if they did this an increase in the volume of work would result, employment would be given to more hands, and the firm of James Dixon and Sons would still further grow and develop.

Royal Observatory Report.

THE Report of the Astronomer Royal to the Board of Visitors of the Royal Observatory, which was read at the Annual Visitation of the Royal Observatory on June 1, refers to the year from May 11, 1888 to May 10, 1889, and exhibits the state of the Observatory on the last named day.

In referring to the Buildings and Grounds, Moveable Property and Library, the Astronomer Royal says that owing to want of space in the Observatory buildings the moveable instruments, clocks, and other apparatus, which are not in actual use, are for the most part stowed away in their boxes in wooden sheds, where their periodical examination and renovation are attended with great difficulty. He suggests that for the proper care of these instruments it would be advisable that they should be housed in a brick building to serve as an Observatory museum for instruments and apparatus of scientific value or historical interest. A building of one storey, about 40 feet long and 30 feet broad, would be suitable for this purpose, and a convenient site could be found in the South Ground, the proposed building being connected with the circular Lassell building. In that situation it would not interfere with the use of any of the astronomical or magnetical instruments, a consideration of much importance.

The clocks and chronographs are all in good order, except the Mean Solar clock, which requires cleaning after the disturbance caused by the renewal of the telegraph wires and batteries. The clock "Hardy," which had not been going well, was cleaned and repaired by Messrs. E. Dent & Co. in January. The new thermograph continued to work well since it was brought into use, after repair by Mr. Kullberg, on October 11, 1887.

The number of chronometers and deck watches being tested at the Observatory was 208 (159 box chronometers, 20 pocket chronometers, and 29 deck watches), 3 of which belong to the Indian Government, and the remainder to the Navy. The annual competitive trial of chronometers commences on July 6, and the trial of deck watches on October 26.

In the year ending May 10, 1889, the average daily number of chronometers and deck watches being regularly rated was 212, the total number received was 668, the total number issued was 601, and the number sent for repair was 282.

The following comparison shows the increase in these numbers since 1851:—

	1851-1855.	1881-1885.	1888.
Average number being rated	97	190	221
Average number received yearly	291	475	654
Average number issued yearly	270	494	599
Average number sent for repair yearly ...	127	267	288

It will be seen that the work on chronometers has doubled in in thirty years, and that there has been a further and more marked increase in the last five years, causing great pressure on the Observatory staff.

The annual trial of chronometers was more severe than in former years, as the chronometers have been tested in the oven at temperatures of 80° and 85°, as well as at temperatures of 95° and 97° Fahrenheit, so that any residual secondary error of compensation would be made evident in the range of temperature from 42° to 98°. Notwithstanding this, the performance of the chronometers generally has been very good, the first 23 (out of 47 sent in for trial) coming up to the standard for Naval service. The first six chronometers, as judged by their trial numbers, performed on the average better than the corresponding chronometers in any previous year, except 1886, when the conditions of the trial were not so severe.

For the annual trial of deck watches; November 24th, 1888, to February 6, 1889, 32 watches were entered, and of these 17 were purchased for the Navy, the first eight being classed "A," or equal in performance (on the 12 weeks' trial) to an average box chronometer. In future the duration of the trial will be increased to 16 weeks, viz., 6 weeks in the ordinary temperature of the room, 4 weeks in the oven, temperature 80° to 85° (the watches being tried in positions during the two middle weeks) and finally 6 weeks in the room.

Two chronometers have been tested for the Austrian Government, and four pocket chronometers for the Government of British Guiana.

There has been no failure in the automatic drop of the Greenwich time-ball, but on one day the ball was not raised on account of the violence of the wind.

The automatic drop of the Deal time-ball failed on thirteen days owing to interruption of the telegraph connections, and on one day high wind prevented the raising of the ball. There has been no case of failure of the 1 p.m. signal to the Post Office Telegraphs.

No return signals have been received from the Devonport time-ball clock since April 23, when, as the Astronomer Royal understands, the clock was cleaned and the contact-springs accidentally put out of adjustment. Up to that date the daily signal had been received regularly since the date of last Report, except on 42 days, of which fourteen were Sundays. The apparent error of the clock-signal (after daily correction of the clock by the help of a time-signal from Greenwich) was under $0^s{\cdot}2$ on 66 per cent. of the days of observation, under $0^s{\cdot}5$ on 92 per cent., between $0^s{\cdot}5$ and $1^s{\cdot}0$ on 7 per cent., and it exceeded 1^s on 1 per cent.

No further action has been taken as regards the proposal to establish hourly time-signals at the Lizard, as with the present pressure on the staff there would be great difficulty in making the necessary arrangements for securing the efficiency of such a time-service.

In the year ending May 10, 1889, there have been failures on 33 days in the automatic signals from the Westminster clock. The error of the clock was insensible on 33 per cent. of the days of observation, 1^s on 28 per cent., 2^s on 28 per cent., 3^s on 8 per cent., and 4^s on 3 per cent.

The transfer to the Post Office Telegraphic Department of the maintenance of the Observatory telegraph wires, batteries, and connections for communicating time-signals, which was proposed in June, 1887, has been carried out, and the renewal of wires and apparatus is now practically complete. The work was commenced early in January and has occupied much more time than was originally anticipated. The Post Office authorities will now take charge of the wires and batteries up to test boards fitted near the various instruments and clocks, these latter remaining of course in our care. The new test boards fitted up by the Post Office will be of great use in localising faults in the telegraphic circuits.

The re-determination of the difference of longitude between Greenwich and Paris was carried out last autumn, the Submarine Telegraph Company having courteously placed a spare wire at our disposal each night from 8 to 12, and the Post Office having provided the services of a clerk, and the use of a wire to London, where it was joined on to the Submarine wire, so as to give direct communication with Paris. Observations were made in four groups of three nights each (or the equivalent in half nights). An English and a French observer were stationed at each end, each with a separate instrument and chronograph, and the pairs of observers were interchanged twice, to eliminate any change in the personal equations during the progress of the work. The pairs of English and French instruments were similar, and the signals as well as the star transits were recorded on similar chronographs. On a full night each observer recorded about 40 star transits, reversing his instrument three times, and exchanged signals twice (near the beginning and end of the evening) with his compatriot at the other end of the line, and once with the other observer. At Greenwich the transits were referred to the Sidereal Standard Clock, and comparisons with the large Greenwich chronograph enable the ordinary determinations of clock-error with the transit-circle to be utilised as well as those specially made with the portable transits. With this object transits of clock stars with the transit-circle were usually taken by four observers on each night during the longitude operations. The actual stations were the Front Court of the Royal Observatory and the Observatory of the Service Géographique de l'Armée at Paris, the position of which with reference to the Paris Observatory has been accurately determined. Commandants Bassot and Defforges were the French observers, and Mr. Turner and Mr. Lewis the English. The observations lasted from September 23 to November 15, and 18 nights of observation at both stations are available, the two English observers having observed at Greenwich 653 transits of clock stars and 165 of azimuth stars, and at Paris 778 transits of clock stars and 165 of azimuth stars. All of these, as well as the signals exchanged, have been read out from the chronograph registers and the reductions are far advanced. Subsidiary investigations of the value of a revolution of micrometer screw, of intervals of wires, of form of pivots, and of errors of the axis-level have consumed much time, the last-named having been a long and tedious discussion.

In connection with the re-determination of the Greenwich-Paris longitude, provision was made for the determination of the difference of longitude between Greenwich and Dunkerque, and it was arranged that the operations shall begin early in June. The observations are to be made by one French observer (Commandant Defforges) and one English (Mr. Turner), and it is intended to obtain eight complete nights of observation at both stations, the observers being twice interchanged. Commandant Defforges also proposes to determine the difference of latitude between Greenwich and Dunkerque.

While stationed at Greenwich last autumn, Commandant Defforges took the opportunity of swinging his reversible pendulums, which were firmly mounted in the Safe Room, to determine the absolute force of gravity at Greenwich in connection with the French series of determinations.

The Indian invariable pendulum has recently been mounted under General Walker's supervision in the Record Room at Greenwich for observations similar to those made in India, in the United States, and at Kew. It is intended to commence the swings without delay, all arrangements being now complete, and a detailed programme of observation having been drawn up by General Walker. By these two operations the French and Indian pendulum determinations will be connected through Greenwich.

The conclusion of the Report deals with the nature of the work that has been done at the Observatory during the period which it covers, and states that while a relief of the charge of examining the optical instruments for the Navy has been appreciated, increase of work in connection with chronometer and deck watch trials is a set-off against it.

Aluminium and its Manufacture by the Deville-Castner Process.

By William Anderson, M.Inst.C.E.*

ALUMINIUM was shown to be a distinct substance in 1754, by Marggraff. It may be ranked among the noble metals, because it does not tarnish, even when exposed to damp and very impure atmospheres, and, until lately, it was almost a precious metal, the price ranging as high as 60s. per pound; indeed, even now, absolutely pure aluminium is scarcely to be obtained, the metal used in the arts being contaminated with from 2 to 5 per cent. of iron, silicon, and other substances. The chemical symbol of aluminium is Al, its atomic weight is 27·4. Aluminium is very widely diffused over the earth, its silicate forms the chief constituent of clays; and enters into the composition of a vast number of minerals, especially of felspars; its fluoride, united with that of sodium, forms cryolite; a ferruginous hydrate is known as bauxite, and forms probably the most convenient ore from which to extract the metal.

The method now generally adopted in preparing aluminium was discovered early in this century by the eminent French chemist, Henri Saint-Claire Deville, and consists in reducing the double chloride of aluminium and sodium, ($2NaCl\ Al^2\ Cl$) by means of metallic sodium at a high temperature. The manufacture, therefore, resolves itself naturally into two parallel processes, the one comprising the preparation of the double chloride, and the other the production of metallic sodium. As sodium to the extent of nearly three times the weight of aluminium is required in the reduction of the latter metal, it will be seen that the cheapness and abundance of the aluminium depends very much on the cost of the sodium, and the quantity in which it can be produced. Till quite recently, the price of sodium was as high as 5s. a pound, and the process of manufacture was so difficult, and even dangerous, that very large quantities could not be obtained. The improvements effected by Mr. Hamilton Y. Castner, in the manufacture of sodium, by which it can be made in any quantity, without the slightest risk, at about 1s. per pound, has rendered it possible to produce aluminium, of about 98 per cent. purity, which can be sold profitably at 20s. per pound.

The object of this paper is to describe the process of manufacture adopted by the Aluminium Co., at the works, which have just been started, at Oldbury, near Birmingham.

We will first take the manufacture of the double chloride of aluminium and sodium. The raw material is hydrate of alumina $Al^2O^3 \times$ water, which is the only oxide of aluminium. It can be prepared in a variety of ways, and from various materials, such as common alum, which is the double sulphate of aluminium and potassium, $AlK\ (SO^4)\ 12H^2O$, from bauxite, which, as already stated, is a ferruginous hydrate, and from other substances, the price being about £13 per ton, when it is sufficiently pure for the purpose.

The hydrate of alumina, in a finely-divided state, is mixed on a suitable floor, with lamp-black, charcoal, and common salt, moistened with water, the mass is thrown into a pug mill, and after being thoroughly mixed and incorporated, is forced through dies, constructed exactly as in a drain-pipe machine, the issuing cylinders of the compound being cut off by wires into pieces about three inches long, which are carried to the tops of the chloride furnaces, and spread out there to dry thoroughly.

The next process is to expose the mixture of hydrate of alumina, carbon, and salt to a high temperature, in presence of chlorine gas, in order to obtain the vapour of the double chloride, which is distilled over, and condensed in the form of a deliquescent, light yellow substance, of very pungent odour. This operation is performed in regenerated furnaces, constructed very like banks of ordinary earthenware gas retorts. The gas from the producers plays round groups of five retorts, set in ovens, in which their temperature is raised to a bright red heat, the exact intensity of which is a matter of much importance, and requires an experienced eye to regulate.

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* From a paper read before the Society of Arts.

The retorts are connected at their mouths—that is, their opening ends—by means of earthenware pipes to gasholders, containing chlorine gas, special means being taken to regulate the pressure of the gas, and the rate at which it is allowed to flow. The opposite ends of the retorts are fitted with pipes, which convey the fumes of double chloride to cast-iron condensers, and thence to brick chests or boxes, the outsides or ends of which are closed by means of wooden doors. Convenient openings are arranged for clearing out the passages, because the double chloride condenses very quickly; the greater portion of it liquifies and trickles down into the brick chambers, while a portion sublimes, and comes over in the form of a yellow powder. The brick chambers are emptied from time to time, and the contents packed away in air-tight wooden chests, a precaution rendered necessary on account of the deliquescent properties of the substance. The reaction which takes place is as follows:—

$$2Al_2\,O_3 + 3C_2 + 4Na\,Cl + 6Cl_2$$
$$= 2(Al_2\,Cl_6\,2Na\,Cl) + 6CO.$$

That is, two molecules of alumina, three molecules of carbon, four molecules of salt, and six molecules of chlorine, give two molecules of double chloride and six molecules of carbonic oxide.

The chlorine gas used in the retorts is manufactured on an enormous scale, being prepared in the usual way, by the action of hydrochloric acid on manganese dioxide, at a moderately high temperature. One molecule of the manganese dioxide combining with four molecules of hydrochloric acid, produces one molecule of manganous chloride, two molecules of water, and one molecule of gaseous chlorine.

$$Mn\,O_2 + 4HCl$$
$$= Mn\,Cl_2 + 2H_2O + Cl_2.$$

The manganous chloride is soluble, and forms the "spent still liquor," which is reconverted into manganese dioxide, by Weldon's method, that is by first neutralising all free hydrochloric acid, by means of powdered limestone, and then adding milk of lime to the neutral solution, when manganous oxide and calcic chloride are formed.

$$Mn\,Cl_2 + CaO = MnO + Ca\,Cl_2$$

By exposing the manganous oxide to a strong current of air, it takes up another atom of oxygen, and becomes again $Mn\;O_2$, or manganese dioxide.

The chlorine plant forms a very imposing part of the factory. The hydrochloric acid is conveyed by a 2-inch gutta-percha pipe a distance of 700 feet across the canal, from Messrs. Chance Brothers' Alkali Works; it is received into six large stone storage tanks, each capable of containing ten tons, and from these it is run, as it is wanted, into two large stone stills, made up of huge slabs of sandstone, cramped together in an ingenious manner by iron bolts and cast-iron angle saddles, the joints being made by means of solid india-rubber cord. In these stills the manganese dioxide and the acid are mixed together, and, being warmed by injected steam to the proper temperature, the chlorine gas is, at first, given off rapidly, and with effervescence; the rate gradually decreases, and at length the disengagement of gas ceases altogether. The chlorine is carried off by means of lead and earthenware pipes to four large lead-lined gas-holders, capable of containing several thousand cubic feet of gas, and from them it is led away to the double chloride retorts, various ingenious devices having been introduced for indicating the pressure of the gas, and measuring the quantity passed into each retort. Chlorine, besides being valuable, is a very disagreeable gas when it gets out of its proper place, hence great care and method are required in manipulating it.

The "spent still liquor," the solution of manganous chloride, is run into a large neutralising well, 20 feet diameter, and 20 feet deep, built of stone, and fitted with agitators; it is there neutralised by intimate mixture with powdered limestone, and is allowed to settle, after having been pumped up to a system of tanks elevated above the oxidising tower, during which process, iron and some other impurities are carried down. The clear solution, which has a pinkish colour, is then run into the oxidising tower, which is a wrought-iron cylinder standing on end, about 12 feet diameter, and 30 feet high, where it is warmed by injected steam; milk of lime is added, and the whole violently agitated by a powerful current of air, pumped in at the bottom of the tower by an 80 h.p. horizontal engine, driving a large double acting air pump. In two or three hours, the manganous oxide has absorbed as much oxygen from the air current as it had at first given up to the hydrogen of the hydrochloric acid, and thus reverts to its original state.

The contents of the tower, now a thick black turbid liquid, are run into a second system of settling tanks, five in number, erected below the level of the tower. The tanks are each 18 ft. square by 7 feet deep, and are used alternately for settling the charges as they are withdrawn from the tower. The recovered manganese dioxide settles out, leaving a clear solution of chloride of calcium, which is drawn off by overflow pipes, and the recovery process is then complete, the manganese mud being thus used over and over again, and re-recovered, suffering but an inconsiderable amount of loss in the process.

We next come to the manufacture of sodium. Previous to the year 1886 sodium was produced by reducing it from the hydrate or carbonate of soda by heating it to a very high temperature, with an excess of carbon, great care being taken to avoid fusion of the mass, to which end lime was added. Fusion was prejudicial to the process, because, when fused, the carbon separated from the alkali, and only a small return was obtained, hence the temperature had to be carried sufficiently high for the alkalis to be volatilised, because only in that form could the soda compounds come into sufficiently intimate contact with the carbon for its combination with the oxygen of the alkali to take place, and set the metallic sodium free. The high temperature required caused great wear and tear of the iron retorts in which the process had to be carried on, and dangerous explosions were not uncommon; the practical effect being that the production of sodium was very limited in quantity, and the price, as already stated, ranged as high as 5s. per pound.

Mr. Castner, a chemical engineer, of New York, became possessed of the idea that, if suitable means were discovered, it would be possible to reduce the sodium and potassium compounds at a much lower temperature by bringing the carbon into intimate contact with the alkalis in a molten condition. If six molecules of the hydrated oxide of sodium commonly called caustic soda be added to one molecule of carbon, it will yield, when heated to a high temperature, two molecules of carbonate of soda, three molecules of hydrogen, and one molecule of sodium—

$$6Na\,HO + C_2 = 2Na_2\,CO_3 + {}_3H_2 + Na_2$$

and the reduction will take place in an atmosphere of hydrogen, provided that a sufficiently intimate contact can be secured between the carbon and the alkali. Mr. Castner's process to attain this end, arrived at after a couple of years of patient experiment, is partly mechanical and partly chemical. He prepares an artificial carbide of iron by coking an intimate mixture of finely-divided iron and pitch, or other hydrocarbon, the result being a heavy metalliferous coke, which, when ground fine and mixed with caustic soda in the fused condition, blends intimately with it, and causes the reduction of the soda at a temperature very much below that hitherto found possible, namely, below that of melting silver, which has been estimated to be about 1,000° C. The chemical reaction during reduction cannot be confidently defined, but it probably is somewhat according to the following formula:—

$$4Na\;HO + FeC_2 = Na_2\,CO_3 + Fe + 2H_2 + CO + Na_2.$$

That is to say, four molecules of caustic soda and one molecule of the carbide of iron, as above defined, produce, in the liquid form, one molecule of carbonate of soda and one atom of iron; while two molecules of hydrogen, one molecule of carbonic oxide, and one molecule of sodium escape in the gaseous state. The hydrogen and the carbonic oxide ignite, and burn with a brilliant flame coloured by the characteristic sodium hue, while the sodium distils and condenses into suitable vessels. The reduction thus takes place in an abundant atmosphere of hydrogen and carbonic oxide, which effectually preserves the sodium from oxidation till it can be safely deposited in mineral oil.

The apparatus for preparing the sodium is sufficiently simple. The caustic soda is received in drums from the neighbouring alkali works of Messrs. Chance Brothers. The finely-divided iron is mixed with melted pitch in iron pots set in a suitable stove, and the mixture of pitch and iron is then calcined into coke in large iron retorts set in an ordinary furnace.

The metalliferous coke is ground into a fine powder by means of ordinary edge runners, and is ready for charging into the sodium retorts, which are of specially ingenious construction, and deserve a detailed description. Each furnace is heated by gas, applied on the regenerative principle, and contains five cast steel crucibles, or pots of an egg-shaped form, arranged with their long axes vertical. The upper part of the egg is formed into the head or cover, much like the artificial Easter eggs, which contain sweets, but it is filled with a vertical pipe, which passes up through the top of the furnace, and forms the passage by which a portion of the charge is introduced, and it also has a lateral branch connected to the condenser, which consists of a small cast-iron vessel, of peculiar form, arranged so as to allow the fluid sodium to trickle out, to let the hydrogen and carbonic oxide gases escape, and to afford facilities for cleaning the passage, so as to prevent it from becoming choked. The form of this condenser is of some importance if the best results are to be obtained. The whole of the head above described is secured immoveably in the upper part of the furnace, and is protected by the oven setting from extreme heat; it can, however, be readily removed if desired. The lower part of each retort rests on the top of a vertical hydraulic lift, which is worked by a moderate water pressure, provided by a special duplex pump, and it is this pressure which, with the interposition of some luting, forms the joint between the head of the retort and its lower portion. The upper part of the lift, or platform, is so arranged that when the retort resting on it is in its place, the aperture in the bottom of the furnace is completely closed. When the lift is lowered, the bottom half of the crucible sinks to the floor level, and a two-wheeled iron hand-truck of special construction is wheeled up, and, catching hold of the crucible by two projections on its sides provided for the purpose, lifts it off the hydraulic ram, and, by the aid of two men, transports it to the "dumping" pits, on the edge of which it is turned on its side, the liquid carbonate of soda and finely-divided iron, which forms the residue, are turned out, and the inside is scraped clean from the opposite side of the pit, under the protection of iron shields. When clean inside and out, the crucible is again lifted by the truck, and carried back to the furnace, receiving a portion of the fresh charge on its way. It is then again placed on its ram and lifted to its place, having still retained a good red heat. It takes two minutes only to remove and clear a crucible; from six to eight minutes performs the same office for the set of five, and the whole cycle of operations, including the distilling of the sodium, requires one hour and fifteen minutes. The five crucibles yield 500 lbs. of sodium per twenty-four hours, so that the battery of four furnaces is competent to yield 2,000lbs., or nearly one ton of sodium per day.

The only portions of this plant liable to exceptional wear are the bottom halves of the crucibles, the durability of which is found to depend very much on the soundness of the cast steel of which they are made, because any pores or hollows are rapidly searched out by the furnace flames. The average duration of each crucible at present is about 750lbs. of sodium, or 125 charges. The carbonate of soda removed from the retorts is returned to the alkali makers, and is again converted into caustic soda, fit for further use.

The six pounds of sodium, the produce of each charge, is allowed to trickle from the condensers into small iron pots, in which, when cool enough, it is covered with mineral oil, and then transported to the sodium store, where it is melted in large pots, which are heated by an oil bath, and cast into ingots of convenient form for the subsequent operations. The strong affinity of sodium for oxygen is well known, hence it is best kept covered by an oil, such as mineral oil, which does not contain oxygen in its composition; and the greatest care has to be taken to protect it from water, because water is decomposed with so much energy by sodium, that the heat caused by the clashing together of the atoms of sodium and the oxygen of the water is sufficient to ignite the liberated hydrogen. Hence, the apparent paradox that, to make the sodium store fireproof, it is necessary to make it waterproof also, and, at the same time, to avoid naked lights, which may chance to set the vapour from the oil on fire.

We have now got the two ingredients required for the production of aluminium, namely, the double chloride of aluminium and sodium, and metallic sodium. The double chloride is broken into small pieces and mixed with cryolite (the native fluoride of aluminium and sodium, 6Na F. Al^2 F^6), and with metallic sodium, cut into thin slices by an ordinary tobacco-cutting machine. The mixture is tightly enclosed in a revolving wooden box, in which it gets thoroughly mixed. This part of the process is somewhat trying, on account of the hydrochloric acid gas given off by the double chloride, which slowly decomposes when exposed to the air. When the ingredients are sufficiently mixed, they are turned out on to the hearth of a regenerative reverberatory furnace, over which the mixing cylinder is placed. The hearth is made to slope towards a lateral opening, which is closed during the process of production by clay, supported by iron plates and keys. There are two furnaces, a small one capable of producing 60 lbs. of aluminium per charge, and a large one which yields 140 lbs. The charge introduced into the furnace melts quickly, and a reaction, represented by the following formula, takes place—

$$2(NaCl)\ Al_2Cl_6 + 3Na_2 = 8NaCl + Al_2.$$

That is to say, one molecule of the double chloride and three molecules of sodium yield eight molecules of common salt, and one molecule of aluminium. The process of reduction lasts about three hours. The melted slag, which consists chiefly of common salt, and the cryolite, which merely served as a flux, is drawn off by breaking the clay stopping of the hearth opening, from above downwards, and, finally, the lower tapping hole is broken through, and a silver stream of metallic aluminium runs out, and is received into cast-iron moulds. The reducing operation requires considerable skill and great attention to the temperature of the furnace, which has to be varied during the continuance of the reaction.

The large furnace is competent to produce 840 lbs. of aluminium per day of 24 hours, and the small one, 360 lbs.

The first portion of metal which runs out, and which forms rather more than three-fourths of the charge, is of the greatest purity; the remainder, which has to be scraped off the hearth, or which gets entangled in the slag, and has to be subsequently separated out, contains a larger proportion of foreign substances. The cause of the difficulty in obtaining the separation of the metal from its slag, consists in the very low specific gravity of aluminium.

The metal is now taken to the casting house, arranged like an ordinary brass foundry, is remelted in plumbago crucibles, and cast into ingots, plates, or bars for subsequent sale or manufacture.

It is evidently impossible, in a paper of this kind, to enter into all the details of manufacture, although these details are of the highest importance in obtaining commercially valuable results. Day by day, as the manufacture progresses, improvements are made which enhance either the economy of production or increase the purity of the sodium or aluminium produced. Such improvements in details cannot very well be made public till their value is thoroughly ascertained, and the protection of the Patent-law obtained when considered necessary.

The following table gives the quantities of the several ingredients employed to make one ton of aluminium :—

Metallic sodium...........................	6,300 lbs.
Double chloride...........................	22,400 ,,
Cryolite	8,000 ,,
Coal	8 tons

To produce 6,300 lbs. of sodium is required :—

Caustic soda	44,000 lbs.
Carbide made from pitch, 12,000 lbs.	7,000 ,,
Crucible castings	2½ tons
Coal	75 ,,

For the production of 22,400 lbs. double chloride is required :—

Common salt	8,000 lbs.
Alumina hydrate	11,000 ,,
Chlorine gas	15,000 ,,
Coal	180 tons

For the production of 15,000 lbs. of chlorine gas is required :—

Hydrochloric acid	180,000 lbs.
Limestone dust	15,000 ,,
Lime	30,000 ,,
Loss of manganese	1,000 ,,

The works are constructed to produce $1\frac{1}{2}$ tons of aluminium per week ; the quantities of the ingredients consumed are, consequently, half as much again as the figures given in the table ; it is easy to see, therefore, that the factory must be on a very large scale, and the brief account of the process which I have given indicates also how complicated the manufacture is, and how much skill and care are necessary to conduct it successfully, if pure aluminium is to be made. The great enemies of the metal are iron and silicon, especially the former. When once it gets in, it is impossible to get it out again by any commercially practicable means, hence every precaution has to be taken to ensure the purity of the materials, to which end a well appointed laboratory, presided over by Mr. Baker, a very able chemist, is kept in active operation.

The works are situated on the Birmingham and Dudley canal in the town of Oldbury, immediately opposite the chemical works of Messrs. Chance Bros., who, as already stated, supply the hydrochloric acid by means of a 2-inch gutta-percha pipe carried across the canal, and conducted right into the chlorine plant. They also send the caustic soda in the most convenient form for working, and at small expense for packing, and offer the like facilities for the return of the spent carbonate of soda.

A dock, which forms a branch of the canal, enters the works and accommodates the boats, from which coal and other materials are lifted by a steam-crane. The gas producers, eight in number, are arranged on each side of the dock, and have their coal lifted at once on to their feeding-stages by the steam-crane, and from these producers the gas flues are led to supply the chloride, the sodium, and the reducing furnaces. The works were designed by Mr. Castner, and they were built under his personal supervision in a very short time, and are now under his direct management, assisted by his able lieutenant, Mr. W. H. Cullen, who has been and still is the resident engineer in charge. It is difficult to speak too highly of the skill and energy which has been displayed, and the steady perseverance which has been exhibited in overcoming the difficulties which presented themselves as the manufacture was gradually brought to its present state of perfection.

Aluminium is endowed with several remarkable properties. It is the lightest of the metals which possess considerable tenacity and hardness. A given volume of aluminium is only a little more than $2\frac{1}{2}$ times (2.65) the weight of an equal bulk of water, whereas iron is $7\frac{3}{4}$ times, copper nearly 9 times, gold $19\frac{1}{2}$ times, and platinum $21\frac{1}{2}$ times as heavy as water. The metal has a bright silvery lustre, it is capable of taking a very high polish, and of retaining its brilliancy and colour under conditions which would rapidly tarnish silver, because it does not oxidise from exposure to either dry or damp air, and is unaffected by that great enemy of silver, sulphuretted hydrogen, or other sulphur compounds present in our London fogs, either at ordinary temperatures, or even at a red heat ; witness the ingots on the table, which are exactly in the same condition as they came out of the moulds. At ordinary temperatures it is not affected by either strong or diluted nitric acid ; weak sulphuric acid has no action on it, neither have sulphuretted hydrogen or sulphide of ammonium, which explains the reason why it does not tarnish, even in very impure atmospheres. The two strips of polished metal before you have been for eight months in a City office, but show no indication of tarnishing. Water has no effect on pure aluminium under ordinary conditions, but if it be made the oxygen pole of a galvanic battery, it is readily converted into alumina, forming a copious white precipitate. The vegetable acids such as acetic and tartaric, have no effect, hence aluminium is admirably fitted for making into cooking utensils, coffee-pots, teapots, &c., its extreme lightness being also an advantage for this purpose. It is not acted upon by the hydrates of potassium and sodium in a state of fusion, but solutions of these alkalis in water dissolve it readily, forming aluminates of potassium and sodium, with evolution of hydrogen. Of this property the silversmith takes advantage in producing very beautiful frosted effects, by plunging the polished metal for an instant into a weak solution of caustic soda, washing in a large quantity of water, and then digesting in strong nitric acid. Its powers of conducting heat are high in the scale, being about two-thirds that of copper ; its specific heat is ·22, only lithium, sodium, and magnesium being above it. Its electrical conductivity is eight times higher than that of iron, and about equal to that of silver, ; its elasticity and tenacity are equal that of silver, and have been determined by Mr. W. H. Barlow at about 12 tons per square inch, but weight for weight, its tenacity would be the same as high-class steel, or 36 tons per square inch, that is to say, bars of equal weight would carry the same loads. Experiments on very fine wire have given the same results. It is very malleable and ductile, when proper attention is paid to annealing during the process of working, a precaution common to the manipulation of most metals. Aluminium of about 97 per cent. to 98 per cent. purity may be rolled into thin sheets, and may be beaten into foil, as thin as any that can be produced from silver and gold. It can be drawn into very fine wire, such as the specimen which I exhibit, if only 1-10ths millimetre diameter, and ought to supersede silver in the manufacture of metallic braid and tissues, because it will never tarnish as silver does. It can be stamped and spun into hollow ware, but there is, as yet, some difficulty in soldering it ; at any rate, the process of performing the operation is known to very few people.

(To be continued.)

The Art of the Jeweller.*

By Carlo Giuliano.

(Continued from page 224.)

IN Germany, a country which has ever been more careful than France of the reputation of her children, a great number of these works have been preserved. The *chambre du tresor* of the King of Bavaria, and the Imperial Treasury of Vienna, contain many pretty vases of different forms, enriched with fine designs and enamelled figures. Nor are the Green Vaults less rich. Among the most remarkable pieces of which the parentage is known, this museum contains, by Wenzel Jamnitzer, of Nuremberg, a casket of silver ; by D. Kellerthaler, who flourished at the end of the 16th century, the baptismal basin, with its ewer, of the Electoral family of Saxony, considered the masterpiece of that artist ; another basin in hammer work, representing fabulous subjects, and a number of bas-reliefs. The Chamber of Arts of Berlin contains also several pieces of goldsmith's work, among which should be specified the following examples :—By Jonas Silber, of Nuremberg, a cup bearing the date of 1583, ornamented with most perfect chasings ; by Christoph Jamnitzer, of Nuremberg, nephew and pupil of Wenzel Jamnitzer, an epergne *(surtout de table)*, in the form of an elephant led by a Moor, and carrying on its back a castle, containing five warriors ; by Hans Peglot, of Nuremberg, a medallion portrait of Albert Durer ; by Matthaus Walbaum, who flourished at Augsburg in 1615, the statuettes of silver which enriched the magnificent cabinet made for the Duke of Pomerania.

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* Read before the Society of Arts on March 19. (From the *Journal of the Society of Arts*).

There are still existing a number of pieces in gold and silver which enable us to appreciate the merit of the goldsmith-artists of the period of which we are speaking. Besides which, in order to supply the places of the silver originals which have been melted, a collection has been made in the Chamber of Arts of various fine bas-reliefs in lead, and vases of pewter, enriched with arabesques and figures, which are considered as proofs or casts from pieces of metal-work of the 16th and 17th centuries.

Among the artists who have most contributed to the good style of the German goldsmiths' work of the 16th century, should be also named Theodor de Bry, who was born at Liege, in 1528, and died at Frankfort-on-the-Maine, in 1598. He engraved a number of pretty designs for the goldsmiths. His handles and sheaths of knives are exquisite both in style and finish. Although Theodor de Bry is more known as an engraver than a goldsmith, there is no doubt that he himself chased, in gold and silver, a few of the pieces for which he furnished designs. The Green Vaults possess a silver table, containing five medallions of gold, surrounded with arabesques aud heads of Roman emperors; this, which bears the monogram, "T. B.," is considered as his workmanship. Neither should we forget John Collaert, an engraver of Antwerp, born in 1540, who has left two series of patterns for jewels remarkable for their finished execution.

The taste that prevailed in France at the end of the 18th century diffused itself over all Europe; and even Italy herself, at the opening of the 18th century, had abandoned the exquisite style which had characterised the great goldsmiths of the 15th and 16th centuries.

Germany, which had hitherto copied France and Italy so closely, had now completely set aside the traditions of the 16th century. We see in the museums of Germany a large quantity of vases, the bodies of which are formed of mother-of-pearl, of rhinoceros horn, or of the ostrich egg, with mounting of the most singular description. The work is always very carefully executed, the workman skilful, but purity of style has entirely disappeared. Irregularly-formed pearls are conspicuous in the jewel work of the period.

A few goldsmiths, notwithstanding, had, as late as the first years of the 18th century, preserved some traditions of better times, and produced some excellent works. We may cite especially Raimund Falz' and Johann Andreas Thelot. Raimund Falz' was skilful in chasing, and made a large number of medallions and bas-reliefs, the greater part of which were designed for the Augsburg cabinets.

In the Chamber of Arts at Berlin are collected a number of proofs in lead of the goldsmith's work of this artist. Thelot flourished at Augsburg. He has left chasings of considerable merit, and acquired a high reputation by the richness, the taste, and the pure drawings of his compositions. The Green Vaults of Dresden possess of this artist a bowl of very fine workmanship, representing Venus rising from the sea. I cannot conclude this sketch of the goldsmith's art in Germany in the 18th century without speaking of J. M. Dinglinger, who enjoyed in his time a great reputation. Born at Biberach, near Ulm, he studied the goldsmith's art near Augsburg. In his youth he travelled and spent several years in France. In 1702, he went to settle at Dresden, and from that period worked almost solely for the Elector of Saxony, King of Poland. Dinglinger excelled particularly in chasing small figures, which he coloured in enamel. The Green Vaults of Dresden contain his finest works. The most curious of all is the representation, in little detached figures of about from two to two-and-a-half inches high, of the court of Aurengzebe, at Delhi. The Great Mogul is seated upon a magnificent throne, surrounded by his officers of state; princes, his vassals, are kneeling upon the steps of his throne, and presenting him with rich offerings, which the officers are eagerly receiving; in the foreground are courtiers and ambassadors from Asiatic princes, attended by a pompous train to pay their court to the monarch, bringing with them valuable presents, among which may be noticed elephants with trappings prepared for war, horses richly caparisoned, camels, and dogs. All these numerous little figures, chased in gold, and enamelled in colours, have been made separately, and the greater number are removable at pleasure. They are distributed over a plateau of silver, upon which the artist has represented three courts of the palace of Aurengzebe. The court in the background, covered with a carpet of cloth of gold, is surrounded with porticos and small buildings, in the midst of which is the rich tent that covers the throne of Aurengzebe. Dinglinger executed this work from drawings brought from India, and from the narratives of travellers who had visited the court of that prince; nothing therefore, can be more correct than the costume. The Asiatic ceremonial etiquette is also strictly attended to. Dinglinger's little figures are chased with extraordinary perfection; they have life, movement, and a highly characteristic expression. He was occupied, it is said, eight years at this work, assisted by his sons and his two brothers, one of whom, George Frederick, was a celebrated painter upon enamel; and he also employed fourteen workmen. The Elector of Saxony paid him 58,484 crowns of Saxony for this piece. Dinglinger was completely enslaved by the vitiated taste of his period, and it is grievous to think that an artist of his merit should not rather have employed time and money in producing something which might at the present day be ranked among works of art.

I might have said something about precious stones in this paper, but I see that on April 8, 1881, Mr. Church, Professor of Chemistry at the Royal Academy, read a paper before this Society on the discrimination and artistic use of precious stones, which contains an excellent list of their names. Professor Church also, in 1883, wrote a catalogue of the Townshend collection of gems in the South Kensington Museum, a handbook which, though small in size, contains much important material that every jeweller should know.

Now we come to consider the condition of the goldsmith of the 19th century. The word goldsmith means a man that makes jewellery or deals in it. Shall we call by the same name the man that has been learning and studying for 21 years (divided into three sevens) to be a jeweller, and the man that has come from an ordinary commercial school, and goes behind a jeweller's counter, and sells jewellery, or what is called jewellery?

The only education I know of in England that a jeweller-shopkeeper receives is in a pawnbroker's shop for two or three years. Now, this man that has been in the pawnbroker's shop thinks that he has received the full education necessary. In fact, he flatters himself that he is more than qualified as a jeweller.

A pawnbroker calls himself a jeweller; a watchmaker calls himself a jeweller; the co-operative stores call themselves jewellers; the linendrapers and hosiers sell jewellery. In fact, almost everybody sells jewellery, and claims to be a jeweller.

But I understand a jeweller to be a man that has studied under a master, or has been an apprentice for seven years in order to learn the elementary education of a jeweller; that is to say, the melting of different metals, and forging, the flatting a piece of gold level by hammering; drawing, pulling, and stretching wire; stamping in different ways, pickling; filing for rounds, squares, ovals, equilateral-triangles, and other forms. These are things which very few jewellers of the present day are able to do. The jeweller should know the several ways of pewter soldering and tin soldering; how to use the blow-pipe for different flames, &c.; the way of tying a piece of work with iron binding-wire. He must also understand turning, sawing, a little engraving, carving, some chasing, embossing, frosting, and friezing; polishing in general, of which there are several modes; spanning and annealing; some plain setting; putting in cement and cementing; colouring several ways, and this involves some knowledge how to use the scratch brush.

The first seven years of apprenticeship will really pass like seven months. Now we come to the second seven years; then the man will commence to do something, and he will begin to realise what he has been doing during the previous seven years. The difficulties will be found to increase, and the second seven years will disappear like seven weeks.

Now we come to another task, which is to understand the different styles of different nations, I should think that approximately there are 50 different styles of jewellery. I will try to mention some of them. There are the various Eastern styles, Etruscan, Greek, Roman, Byzantine, Italian, and the Celtic, and these are divided into sub-styles.

Of course the young jeweller must have learnt drawing, such as elementary geometry, freehand drawing, and some studies from the nude. He must work intelligently; he must learn to know his business, and he must, when he is asked to do any particular work in jewellery, be able to perform the task satisfactorily.

Unless a man studies all the different styles he will not acquire any refinement in the art of the jeweller, and he will not be able to make any true jewellery.

When a jeweller makes his sketches, he has first to consider the style he intends to adopt, that will give him the limit of the extension of the composition. His object will be to produce the largest amount of beauty in the most limited space possible under the circumstances. A piece of goldsmith's work need not necessarily be expensive; it is the style, the design, the form, that will give that grace and refinement which will give one joy or pleasure to look at. The very word itself is derived from the Italian word *giojello*, meaning joy, pleasure to the eye.

It is one thing to make a design for a piece of jewellery in gold work or enamel and gold, and quite another to make a design for the setting of precious stones. The former is like making a panel for a drawing-room, and the latter is like making a tessellated pavement in mosaic.

Often when anyone goes to a jeweller-shopkeeper or manufacturer, and shows him precious stones, if they are white, they are pronounced to be brilliants or glass; if red, they are rubies or garnets; if green, they are emeralds or glass; and if blue, they are called sapphires or lapis-lazuli; if of any other colour or shade, they are called merely fictitious stones; and if white and shiny, of course they are called pearls, or sometimes Roman pearls.

Such is the knowledge of the shopkeeper of the 19th century, as he is seen in Great Britain, and perhaps abroad as well, and this in spite of all our technical education and the advantages presented by the South Kensington Museum, British Museum, and other great institutions. To remedy this, a young man must go into the workshop, and after the first seven years, if he has been in a proper workshop, he will appreciate the advantages of these great and useful institutions, and have a chance of earning from £1 to £5 or £6 per week.

As I said before, let a young man go into a workshop where he can find a good teacher, who ought to be the master, and who, I consider, ought to teach the apprentice. A workman in the shop will not teach a younger man, because, if he is intelligent, the workman is selfish enough not to do his duty in teaching his fellow; for, being advanced in years, he is afraid of being replaced by the younger man.

But now, what inducement is there for the young man to learn his business? Suppose he has been an apprentice, and is very intelligent; he goes into another manufactory where the master knows little or nothing, and the foreman even less.

If jewellers thoroughly learnt their business, we should not have so much foreign rubbish, some of it called "Rococo," with daubs of Aspinall's enamel on it.

It may be said that it is easy to criticise and destroy, but what is the remedy? The remedy that I would suggest is that Government assistance should be obtained, and that all those people who serve the public as shopkeepers or manufacturers must pass an examination in their business, and obtain a certificate, say of first, second, or third class, which the public could see when they were doing business with them.

If a man calls himself a doctor, it is because he has studied medicine; a lawyer, because he has studied law; so it is with the army and the other professions. In all the professions a man must pass an examination. Why is not that rule extended to the jeweller?

Now the jeweller does not receive the education required for business by which he gets his living. This examination, in which a man should make a sketch, produce a piece of work, and describe the style he adopts, should be conducted by a guild of his own trade, and unless the piece of work produced is of good quality he should not receive any certificate at all. That certificate would replace the silver licence, and the jeweller would pay an annual fee, that is, provided he wishes to become a shopkeeper or manufacturer. No man could sell any goods as a manufacturer or shopkeeper unless he had given proof of his ability. As it is, a man who knows his business is often passed over unnoticed, and the man who has not received an education for the business he is carrying on is encouraged, and people say, "poor fellow, he is very industrious, give him a turn." Now, why did not this man become an apprentice and learn his business? No one would have been jealous of him then.

The goldsmith's art is not a mere business, as the public suppose it to be—it should be an artistic occupation. I affirm that it is a fine art, and one that embraces the fine arts of architecture, sculpture, painting and music. Everybody knows that a goldsmith makes caskets, vases, centrepieces for tables, and many other monumental objects, which must have a base to form the work.

Is not this architecture? And if the jeweller has not some knowledge of this fine art, his production will have no sense in it; for he must construct before he decorates. Then there are sure to be some anatomical figures, no matter of what description the design may be—is not that sculpture and modelling? And when there is enamel mingled with it—which may be translucent, *cloissonnè* or painted—is not that painting a picture. Fourthly, music; do not all these things require harmony? This is the goldsmith's art, and is it not the sister art of those four fine arts; does not a man require to learn all I have described before he calls himself a goldsmith?

"Art is long and life is short."

Woman as related to the Jewellery Trade.

By Mrs. M. E. Purdy.

AT the Ohio Jewellers' Association's Annual Meeting, held in May last, the following paper was read by Mrs. Purdy:—

Instead of trying vainly to create a demand for jewellery that is a caricature of ornamentation, turn your attention to supply the new and growing demand for articles of home adornment and utility, and a class of jewellery that is in harmony with the more delicate sense of beauty of this cultured age. This demand being an outgrowth of a higher ideal of the beautiful, and in perfect accordance with the best and truest sentiments, is in no danger of waning and leaving you with an overstock of unsaleable goods. We hear and read much about the caprice of fashion; but if we carefully observe the phenomena of fashion's changes, it will be found that there is an underlying commonsense reason in much that is called caprice, and that these changes are often significant of moral and intellectual transitions.

That many are awakening to a sense of these changed conditions is evidenced by the almost endless variety of articles now found in jewellery stores that are called innovations, articles that are made to ornament the home, the boudoir, the library, the dining room; articles of personal utility, such as umbrellas and canes, with beautifully wrought handles in gold and silver, handles of brushes, etc., leather goods of every description with silver trimmings, picture frames; elegantly bound books with silver corners and clasps. These beautiful accessories to home adornment furnish ample scope for the skill of the silversmith, and open a field of enterprise which the jeweller is entering largely into in the cities. The increasing favour that table silver is obtaining accords with the finer sentiments, as it makes bright and attractive the table around which we gather the home and social circle; and so it will be found in the entire range of ornamentation adopted by intelligent men and women, it is the outward manifestation of inward character. Take up any trade paper you will, in England or

America, and you will find a universal agreement that the better class and neater styles of jewellery are growing in favour, while showy and meaningless articles are scarcely called for. . . . .

Allow me to throw in a suggestion, which I trust you will take kindly, even if you do not give it your assent. It is the advantage you may gain by employing the talent woman possesses in your business. No one can interpret the taste of woman like one of her own sex; and however you may pride yourself on your acumen in that direction, the fact remains that very few men should ever undertake to select ornaments for a woman to wear.

If you have a wife who is qualified with just ordinary talent and possesses taste enough to dress herself well, let her select your jewellery; educate her in your business and encourage her to take an interest in all that concerns you financially. It is really just as much her interest as your own, and you may by developing her talents discover in her a treasure of financial gain. Marriage would less frequently prove a failure if wives more thoroughly understood and sympathised with the business pursuits of their husbands; and the jewellery business being so peculiarly suited to womanly capabilities, it is a fruitful field in which to develop her genius, and secure to you a partner whose interests are identical with your own. . . . .

Much has been said by Col. Ingersoll and others about the mistakes of Moses, but none of them have ever mentioned the greatest mistake that Moses made; it was in omitting from his code of morals a separate and distinct list of duties to govern the jewellery trade, for it has been demonstrated repeatedly that there is nothing in the decalogue that fits their case specifically, and the moral obtuseness of a large portion of the craft is such that unless a written contract with ample specifications is drawn up between man and man, they do not recognise any moral obligations.

Strange, too, that Moses should have overlooked this when the first trouble he had after coming down Mount Sinai, was on account of the jewellers. It is a study in moral science to observe that in the long line of succession from that far-off time to the present day the same spirit has been preserved in this unique craft, for we read that "Moses said unto Aaron, what did these people unto thee that thou hast brought so great a sin upon them?" And Aaron said: "Let not the anger of my Lord wax hot; thou knowest the people that they are set on mischief. For they said unto me make us Gods which shall go before us, for as for this Moses, the man that brought us up out of the land of Egypt, we wot not what has become of him; and I said unto them, whosoever hath gold let him break it off. So they gave it me, then I cast it into the fire and there came out this calf." Thus you see the origin of the grounds of justification that are in use at the present day, "the people are set on mischief."

We only supply the demand and furnish what the people want; they do not want honest goods, but will go out of their way to be humbugged.

We receive an order for 10-carat goods to be marked 18-carat and we simply fill it. It is not our province to keep the conscience of those who distribute. We manufacture the goods that are wanted, and after they leave our hands we have no jurisdiction over them.

So the manufacturer is perfectly innocent, and all the responsibility for the demoralisation of the trade falls back upon the retailers and the calf they clamoured for; this calf for which the trade have sacrificed their gold, their liberty and independence; this God that goes before them, that the manufacturer bows down and worships, and the sad thing about it is that so many of the people say amen (when we say people here we mean the retail jeweller), the people who are the consumers know and care nothing about all the tumult that is going on in the camp of the Israelites.

This golden calf dictates terms to the manufacturer till he dare not claim to have a soul of his own, and the most pitiable sight that the trade has to witness is the spectacle of the retail jewellers carrying this calf on their shoulders.

Lenses.

DR. C. A. BUCKLIN edits in the New York *Jewelers' Circular* a series of articles on Mechanical Ocular Defects, from which the following article on Lenses will prove instructive to many of our readers.

We will now consider the special action of various lenses on light, their measurement, quality, analysis and framing. We have already seen that convex lenses focus all rays of light passing through them at a common centre. Theoretically, *the double convex* lens has two equally convex surfaces; practically, their convexities are more frequently unequal. Thus, if a grinder wishes to produce lens No. 6½, he grinds on one side with a shell made to grind convex six, and on the other side of the lens he grinds the surface with a shell used to grind convex seven.

The periscopic convex lens has a convex surface on one side and a concave surface on the other, in proportion as the sharpness of the convexity exceeds the concavity; the lens acts as a convex lens.

The plane convex lens has its entire convexity on one side, the other side being plane.

Some persons can see through a given double convex lens, but they are unable to use with comfort the same number of periscopic convex lenses, while other individuals can use the periscopic but cannot use the double convex lenses. The majority of individuals can see equally well through either lens.

By glancing obliquely through any convex lens at an astigmatic disc, it will be observed that a most decided cylindrical effect has been produced; this effect is much more decided in double convex than in periscopic lenses. The individual who has a slight astigmatism, which by utilising the cylindrical effect produced by looking through double convex lenses obliquely can correct the astigmatism, prefers double convex lenses. The individual who has a slight astigmatism, which is increased by the cylindrical effect produced by looking obliquely through any convex lenses, has trouble with all convex lenses, especially double convex lenses. These individuals will complain that if they wish to see distinctly through their glasses they must hold the reading matter up and thus tire their arms. The moment they allow the book or paper to be lowered to a position comfortable for their arms the glasses annoy them. Very small degrees of astigmatism which never attracted the attention of the individual during early life produce this form of annoyance when the individual becomes presbyopic. A weak concave cylinder may be required with axis placed horizontally or a weak convex cylinder may be required with axis vertical to correct a degree of astigmatism which, added to the effect produced by looking obliquely through any form of convex lens, becomes troublesome.

Measurement of lenses. Convex lenses have been and are still measured by the inch system. The inch of the country in which the lens are manufactured is used to measure the distance at which any given convex lens will bring to a focus *parallel* rays of light. This distance expressed in inches represents the number of the lens. The number of a concave lens is determined by the power of the convex lens required to neutralise it or by an instrument called a "*foco meter*," which measures the diminishing effect which the introduction of any concave lens produces on the convex system already existing in the instrument.

The want of uniformity in the inch measure among various nations was undoubtedly the cause of the introduction of the *metric system* for measuring the value of lenses. The following comparison of different values will illustrate the difficulty:

The meter contains 39.37 English inches.
,, ,, ,, 37 Paris ,,
,, ,, ,, 38.23 Prussian ,,
,, ,, ,, 38 Austrian ,,
One English inch contains 25.4 mm.
,, Paris ,, ,, 27.07 ,,
,, Prussian ,, ,, 26.16 ,,
,, Austrian ,, ,, 26.28 ,,

All inches are divided into 12 lines ; therefore,

One English line = 2.1116 mm.
„ Paris „ = 2.256 „
„ Prussian „ = 2.18 „
„ Austrian „ = 2.19 „

The difference between the English and French inch is $\frac{1}{12}$.

The inch system has been objected to on account of the irregularity of the focal interval between the lenses of weak power compared with those of high power. *Second*—The lack of uniformity of the inch in various nations. *Third*—The inch numbers represent focal distances, and as such are not quickly added or subtracted from each other. In adding or subtracting the values of lenses, their refractive indices must be added or subtracted. The refractive index of a lens is the inverse of its focal distance ; thus No. 20 convex has a refractive index of $\frac{1}{20}$. Now, to add two lenses, No. 20, together we would be obliged to add $\frac{1}{20}+\frac{1}{20}=\frac{1}{10}$, or the fraction $\frac{1}{20}$ can be reduced to a decimal; the decimal fractions may then be added as whole numbers. In the table given below, opposite the decimal found by this addition will be found the number of the lens sought.

In the dioptric system no attempt is made to give the focal values of the lenses. A lens of one meter focal value is called *one* dioptric. *One* is the refractive power of the lens. Two such lenses would make two dioptrics. It was proposed to introduce a uniform interval between all the lenses when the metric system was introduced. In this particular they completely failed to in any way improve the irregular interval which exists in the inch system. When we push a convex lens one inch away from the eye we increase its number one; thus if I push convex No. 2 one inch from my eye the lens becomes convex No. 1. Now, the great increase of power produced by adjusting strong lenses enables the individual to compensate for an immense focal interval. With weak lenses nothing practical can be gained by this method of adjusting the distances of the lens; thus if we push convex 40 one inch away it becomes No. 39. Now, the the difference between lens No. 39 and 40 would be $\frac{1}{1560}$, or lens No. 1560. No advantage being gained by adjusting the distance of these weak lenses, we are obliged to have a large number of lenses with a much smaller focal interval than we had among the strong lenses. The irregular focal interval found in the old trial sets, which was determined by meeting the practical requirements, has in no way been improved by the metric system.

The following table gives the various lenses found in the trial cases and their focal valves, *decimal* refractive indices and dioptric numbers :

Focus in inches.	Refractive power in decimals.	Number in dioptrics.	Focus in inches.	Refractive power in decimals.	Number in dioptrics.
160		025	9	·111	4.5
80	·013	05	8	·125	5
60	·017	(·0.67)	7	·143	5·5
50	·020	0.75	6½	·154	6
40	·025	1·00	6	·167	6·5
36	·028	(1.11)	5½	·182	7·5
30	·033	1·25	5	·200	8
24	·042	1.5	4½	·222	9
(22)	·045	1.75	4	·250	10
20	·050	2.	3¾	·267	10·5
18	·056	225	3½	·286	11
16	·063	2.5	3¼	·308	12
14	·071	2.75	3	·333	13
13	·077	3	2¾	·364	14
12	·083	3.25	2½	·400	16
11	·091	3.5	2½	·444	18
10	·100	4·	2	·500	20

We are in fact using the same lenses which always have been used and it is a mistake to suppose that the appearance of any special system of measurement makes any difference in the practical selection of glasses.

Quality of Lenses.—Lenses are manufactured from all qualities of glass and from quartz, crystal and pebble. The power of lenses ground in the same cutter vary considerably owing to the density or refractive index of the substance used. One made of very hard glass will focus stronger than one made of soft glass. A lens ground from a pebble will focus higher than any lens with the same surface which is ground from glass. This is one of the reasons why old people frequently see considerably better with "pebbles" than with the same number of glass lenses. Pebbles are hard and will not scratch, consequently they do not in convex lenses become opaque from innumerable scratches. They become more thoroughly charged with electricity by friction than glass lenses, consequently in certain factories where lint and dust fills the air they become instantly so coated with these particles as to become useless. Pebbles have, however, an advantage to artisans which cannot be thoroughly appreciated by those who have not had experience. The centres of the lenses do not become opaque from scratching where the lenses are carried exposed on a hook.

The best method of detecting a pebble is the pocket polariscope designed by the author. It consists of a short metal cylinder with two pieces of turmalin with the cleavage of the mineral set at right angles ; this completely excludes the passage of light, because light can only pass through turmalin in the line of its cleavage, consequently the light which comes through the first piece of turmalin is completely obstructed by the other piece.

A slot in the cylinder allows any lens to be placed between these two pieces of turmalin. Glass allows light to pass directly through, consequently when a glass lens is placed in the slot, no light can be seen through the instrument. Quartz has a circular polarisation. When a quartz or pebble lens is placed in the slot, the light which comes through the first piece of turmalin is twisted by the pebble so that it falls in the line of cleavage of the second piece of turmalin, thus light is seen through the instrument and can only be seen when a pebble lens is in the slot.

American Items.

The New York Jewellers' Board of Trade recently met with a loss in the death of their president, Mr. William Smith. Widely known among the trade, he was, says *The Waterbury*, a power in every enterprise wherewith he had been connected, and his absence will be a matter of recurring memory to those who were so well accustomed to his influence.

A New-Fangled Wedding Ring.—There is a constant demand for novelties in wedding rings now-a-days as well as in every other article of luxury, and a jeweller has to meet the demand or lose the very desirable custom of young couples contemplating matrimony. This season has brought forth the most curious and beautiful wedding rings yet designed by the trade. The *New York Sun* is responsible for a description of one which especially looks just like any other ring, the only difference being that it has a crooked scratch across the surface. But when a tiny pair of jewellers' pincers are thrust into the inner edge of the ring opposite what appears to be the scratch, and the needle pressed lightly, instantly the ring drops into one's hand transformed into tiny hoops of gold looped together. The needle split the ring into two halves, each half having a flat, broad edge. These flat surfaces are designed for the purpose of being engraved with any tender or romantic inscription that the bride or groom desires to have placed upon the ring, and they will contain much more than can be put upon the inner surface of an ordinary ring. After the engraving is done the ring is closed again by fitting the two hoops together, and locking them securely by a concealed latch fitted on the inner edge of the hoop. It requires the closest scrutiny to discover that the ring is not an ordinary hoop of gold. These rings have made a big hit. One of them was used at a swell society marriage in a Fifth Avenue church the other day. The society belle who was the bride made the selection herself.

Canadian Trade.—Business during the past month, says the Toronto *Trader*, although quiet, has shown a marked improvement. The weather has been unusually fine, and the crop prospects throughout the Dominion are the best for the season that we have had for many a long year. Taking it altogether the outlook is brighter than for some time past, and merchants are accordingly feeling more like taking chances on the future.

Repairing and Polishing Marble Clock Cases.

MONSR. L. CHOISY publishes in the *Union Horlogerie* a method of repairing and polishing injured marble cases, of which the following is a translation:—

It happens often that the marble case of a mantel clock is injured by accident or unskilfulness; its corners are generally the first to suffer. If the damage is not so great that there is no other way than to replace the old case by a new one, the repairer may make the case a little smaller until the edges are reproduced, after which the polish is restored. Proceed as follows:—

With a file take off from the damaged part as much as necessary, taking care, however, not to alter the original shape of the case. Then grind off the piece worked with the file with a suitable piece of pumice stone and water, and continue the grinding next with a water stone until all the scratches have disappeared; special care, however, must be paid to the corners and contours. After this take a hard ball of linen, moisten it, and strew over it either tripoli or fine emery, and produce a polish by rubbing until a certain lustre is produced. Finish polishing with another linen ball, using with it finely washed emery and rouge; dry and finish the polish with a mixture of beeswax and oil of turpentine. This method may be used for all sorts of marble.

In cases where the fractures are very deep, so that the object cannot be made much smaller without ruining the shape, the damaged parts may be filled with a cement, prepared with finely powdered marble and a little water glass. Stir this into a thick paste, which fill into the deep places and permit to dry; after drying correct the shape and polish as recommended for marble.

If the broken off or out pieces are on hand they may be glued in place again. Wet the pieces with an aqueous solution of silicate of potash, insert them into the fractured places and let dry for 48 hours.

For white marble, egg albumen with a little Vienna lime must be used.

In order to impart a high lustre to whited marble objects which have become dim, it suffices to cover them with a fluid solution of oil of turpentine and virgin wax, and then to rub them dry with a linen or cotton cloth. A handsome lustre is invariably produced by hard rubbing.

A Gas Blowpipe.—An American paper says that in a shop where gas is available, a handy blowpipe can be made out of the ordinary gas fixture, a piece of ⅛-in. brass pipe, and some rubber tubing. Use an ordinary gas-burner, with the tap in the horizontal pipe, while the burner is fitted from an elbow at right angles with the horizontal pipe. Drill a hole in bottom of tube in which the burner is placed, knock out the lava tip and the wire screen, then insert ⅛-in. brass pipe through hole in elbow, so that the pipe will come in centre of upright tube, and end about midway between horizontal pipe and end of burner tube. Solder firmly the brass tube, then put the rubber on protruding end, and fit a mouthpiece so that it may be easily held when blowing through the tube. Light the gas above the burner tube in the ordinary manner. Upon giving a gentle stream of air through the rubber tube, a long blue flame, intensely hot, will be projected above the burner tube, and its size may be regulated by the quantity of gas admitted by the gas-cock. For large work, such as heavy hard soldering, a ⅛-in. air-pipe will prove large enough; while for small, delicate soldering, such as jewellers' work, an ordinary blowpipe nozzle should be attached to the ⅛-in. tube. The burner tube may be unscrewed at will, and the nozzle left exposed. By cutting a thread on the blast pipe, different sized nozzles may be screwed on at will. When at work the burner tube becomes quite hot, heating the gas and air contained within it, thus giving what is known as the "hot blast," so much sought after by blowpipe makers, and sometimes secured by bending the blast-pipe into a coil, and placing the same over the gas-flame, where it will become quite hot.

Applications for Letters Patent.

The following List of Patents has been compiled especially for *The Watchmaker, Jeweller and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323. High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; and 6, Lord Street, Liverpool.

8,445. Charles Fischer, London, for "Anti-neuralgic earrings." Dated May 21, 1889.

8,467. H. H. Lake, a communication from S. Ferrando y Morel, Spain, for "Improvements in devices for preventing the stealing of watches and other articles carried in the pocket." Dated May 21, 1889.

8,495. J. Johnson and H. Cammann, Birmingham, for "Improvements in studs and solitaires." Dated May 22, 1889.

8,547. A. Lecoultre-Piguet, London, for "Improvements in chronographic watches." Date applied for under Convention, December 4, 1888.

8,660. A. J. Loftus, London, for "Improvements in dial plates and the inscriptions thereon, and other plates and labels for marine chronometers and survey watches, and in the hands therefor." Dated May 24, 1889.

8,662. C. Reeves, Westminster, for "Improvements in and relating to alarums in connection with clocks." Dated May 24, 1889.

8,727. R. Fennell, Coventry, for "Improvements in watches." Dated May 27, 1889.

8,853. G. H. Knight, London, for "Improvements in the manufacture of plated rings for jewellery." (Complete specification.) Dated May 28, 1889.

8,854. G. H. Knight, London, for "Improvements in the manufacture of plated rings for jewellery." (Complete specification.) Dated May 28, 1889.

8,972. W. A. Price, Birmingham, for "Watch protector." Dated May 30, 1889.

8,974. J. M. Davis, Birmingham, for "An improvement in sleeve links, which is also applicable to other such like articles." Dated May 30, 1889.

8,977. J. C. W. Jefferys, London, for "Improvements in sleeve links." Dated May 30, 1889.

9,214. J. Ashwin, Birmingham, for "Improvements in swivels for watch keys." Dated June 4, 1889.

9,223. J. W. Mason, Edinburgh, for "Showing universal times by one dial, called a world clock or new hour map of all the globe with clockwork thereto." Dated June 4, 1889.

9,452. J. Ashwin and P. H. Lawrence, Birmingham, for "Improvements in bow attachments for pendants of keyless and other watches." Dated June 7, 1889.

9,831. R. Radlanski, London, for "Improvements in clock works." (Complete specification.) Dated June 15, 1889.

Gazette.

PARTNERSHIPS DISSOLVED.

P. Stubs and H. Appleton (trading as Peter Stubs), Warrington and Rotherham, file manufacturers. Renton and Warner, Wardour Street, engravers. W. Elmore. J. T. Cooper, and J. J. Atkinson, Charlotte Street, Blackfriars, electro-metallurgists. Jackson Bros., Sheffield, pawnbrokers. Cornell and Heeps, Mare Street, Hackney, jewellers. Butler and Moss, Newark-upon-Trent, pawnbrokers. W. and G. Johnson and Co., Birmingham, metal rollers, Twine and Moulson, Birmingham, manufacturing jewellers. J. Joseph and Sons, Birmingham, jewellers.

THE BANKRUPTCY ACT, 1883.

RECEIVING ORDERS.

To surrender in London.—North, L. E., Hatton Garden, diamond merchant.

To surrender in the Country.—Turner, John Bernard, Poole, watchmaker. Kaiser, Mary, Leamington, optician. Greaves, Geo., Leeds, file-cutter. Bray, Alfred Robert, Herne Bay, watchmaker. Dimmack, Matthias, jun., Bilston, metal refiner.

PUBLIC EXAMINATIONS.

J. W. Carr, Lowestoft, pawnbroker, July 9, at 11.

NOTICES OF DIVIDENDS.

M. W. White (trading as Johnson and White), Red Lion Street, Clerkenwell, silversmith, 2½d., first and final, any day (except Saturday) between 11 and 2, Chief Official Receiver, 33, Carey Street. Fanny Norris, Redcar, jet and fancy goods dealer, 4½d., first and final, Official Receiver, Middlesbrough. W. Issachar, Cheltenham, late jeweller, 1s. $2\frac{9}{16}$d., first and final, Official Receiver, Gloucester. Clara Foord and Ellen Pickersgill (trading as J. B. Foord and Son), Hastings, jewellers, 4d., second and final, 13, Temple Street. Birmingham. G. Hudson, Hastings, jeweller, 4d., first and final, Wholesale Traders' Association, Birmingham. J. S. Levy, Barbican, City, importer of clocks, 1s., second, July 3 or any other Wednesday, Seear, Hasluck and Co., 17, Holborn Viaduct, E.C.

Recent American Patents.

Brooch Pin. B. von Bültzing-Slöwen and M. Howard... ...	402,701
Button. R. H. Lewis	403,477
Chain. J. Ingram	403,591
Clock Frame. D. A. Wiant	403,812
Clock Striking Mechanism. A. M. Lane	403,275
Clock Striking Mechanism. D. J. Gale	402,917
Combined Paper Weight, Calendar and Musical Watch. E. N. Gaillard	402,916
Electric Alarm Clock. T. H. Grady	403,100

Electric Clock. E. G. Hammer	402.823
Fountain Pen. L. A. Shattuck	403,225
Gold Beater's Hammer. H. B. Hughes	402,526
Gravity Clock Escapement. F. Gundorph	403,099
Magnetic Shield for Watches. H. P. Pratt	403,211
Mechanical Musical Instrument. W. H. Gilman	403,834
Method of Rendering Nickel and Nickel Alloys Non-Magnetic. H. Ostermann and C. Lacroix	404,220
Ornamental Ring for Jewellery. G. H. Knight	404,092
Ornamental Ring for Jewellery. G. H. Knight	404,093
Ornamental Ring for Jewellery. G. H. Knight	404,094
Pen. H. Beichling	404,249
Pencil Holder. S. Wales	403,567
Penholder. A. S. Hubbell	403,190
Penholder. G. W. Baldwin	404.027
Ring. F. Kaffeman	403,112
Safety Attachment for Watches. C. G. Krebaum	403,943
Setting Mechanism for Alarum Clocks. A. M. Lane	403,274
Stem Winding and Setting Watch. A. M. Yeakel	403,820
Stem Winding and Setting Watch. O. F. Stedman	403,787
Timepiece. Hugues Rime	402,972
Timepiece Dial. A. Fischer	403,338
Timepiece Dial. M. V. B. Ethridge...	403,525
Trial Frame for Oculists and Opticians. A. L. Smith	404,803
Watch Case Pendant. W. W. Bradley	403,511
Watch Case Pendant. E. C. Rohrer and I. Joseph	403,799
Watchmaker's Lathe. S. Messerer	404 099
Watchmaker's Staking Tool. G. Martel	403.849

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

Dorset.

Hillier, George, Salisbury Street, Shaftesbury, watch and clock maker and jeweller. Trustee, Isaac Phillips, 86, High Street, Islington, dealer in watches, &c. Unsecured Liabilities, £143 0s. 7d. Estimated Net Assets, £91 18s, Creditors (preferential), £16 10s. Deed of Assignment and Inspectorship with a view to pay a composition of 10s. in the £, 2s. at 3 months, 3s. at 6 months, and 5s. at 9 months. Deed of Composition dated May 21, 1889; filed June 7, 1889, by order on terms.

Gloucester.

Martin & Company, 4, Imperial Circus, Cheltenham, goldsmiths, silversmiths and jewellers (partners, William Hulbert and James Ryland, both of Cheltenham aforesaid, trading as). Trustee, H. E. Preen, Kidderminster, C.A. Unsecured Liabilities, £6124 10s. 7d. Estimated Net Assets, £4000. Separate Estate of W. Hulbert—Unsecured Liabilities, £593 16s. Estimated Net Assets, £157 10s. Creditors fully secured, £1100. Separate Estate of J. Ryland—Unsecured Liabilities, £488 17s. Estimated Net Assets, £200. Creditors fully secured, £700. Deed of Composition dated May 30, 1889; filed June 5, 1889.

Lancaster.

Ainsworth, H. J. (Hargreaves James Stuttard Ainsworth, trading as), 34, Blackburn Road, and Christchurch Terrace, Accrington, watchmaker and jeweller. Trustee, G. A. Whiteside, 39, Birtwistle Street, Accrington, manager and another. Unsecured Liabilities, £207 11s. Estimated Net Assets, £133 2s. 7d. Deed of Composition dated June 15, 1889; filed June 21, 1889.

Simpson & Co. (Samuel Clany Simpson, trading as), 92, Shudehill, and 239, Moss Lane East, Moss Side, Manchester, wholesale jewellers. Trustee, Samuel Tilzey, 79, Mosley Street, Manchester, accountant, with a Committee of Inspection. Unsecured Liabilities, £1238 13s. 11d. Estimated Net Assets, £989 12s. 8d. Deed of Composition, dated June 18, 1889; filed June 21, 1889.

Middlesex.

Simpson, Samuel Isidore, 5, Marquess Grove, Canonbury, wholesale jeweller. Trustee, Allen Edwards, Bennett's Hill, Birmingham, C.A. Unsecured Liabilities, £1867 15s. 3d. Estimated Net Assets, £1580 3s. 3d. Creditors fully secured, £61 15s. Composition, 12s. 6d. in the £ by five instalments at 3, 6, 9, 12 and 15 months from date of Deed, the last two being secured. Deed of Composition dated May 31, 1889; filed June 4, 1889.

Cook, Henry James, 94, Upper Street, Islington, fancy jeweller and stationer. Trustee, J. W. H. Byrne, 81, Gracechurch Street, London, E.C., C.A. Unsecured Liabilities, £1435 5s. 11d. Estimated Net Assets, £240. Creditors fully secured, £76 11s. Deed of Composition dated June 4, 1889; filed June 8, 1889.

Sussex.

Boxell, Thomas (Joseph Boxell, trading as), 43, King's Road, and 91, Upper North Street, Brighton, watchmaker and jeweller. Trustee, Frederick G. Clark, Post Office Chambers, Brighton, accountant. Unsecured Liabilities, £1646 13s. 1d. Estimated Net Assets, £1030 9s. 4d. Creditors fully secured, £1258 13s. 1d. Deed of Composition dated June 14, 1889; filed June 21, 1889.

Sussex and Middlesex.

Szapira, Samson, 35, Western Road, Brighton, and 34, Oxford Street, London, watchmaker, jeweller, and fancy goods dealer. Trustee, Alfred T. Hawkins, 22, Budge Row, Cannon Street, London, E.C., accountant. Unsecured Liabilities, £646. Estimated Net Assets, £330. Creditors fully secured, £175. Deed of Composition dated May 27, 1889; filed June 1, 1889.

Yorks.

Heselton, James Cape, The Market Place, Beverley, watchmaker, jeweller and silversmith. Trustee, Robert Hodgson, Parliament Street, Hull, C.A. Unsecured Liabilities, £2075 0s. 5d. Estimated Net Assets, £450. Creditors fully secured, £1780. Deed of Composition dated May 31, 1889; filed June 4, 1889.

BANKRUPTCY.

Re John Bernard Turner.—The first meeting of the creditors of John Bernard Turner, of the Old Post Office and Charlton Villa, Parkstone, in the county of the town of Poole, watchmaker and jeweller, was held last month at the office of the Official Receiver at Salisbury. The summary of debtor's statement of affairs showed gross liabilities amounting to £334 16s. 4d., of which £326 16s. 10d. are expected to rank. The assets were stated at £190 10s. 10d., leaving a deficiency of £136 6s. The debtor alleged that bad trade and being unable to let apartments were the causes of failure. He only had £50 when he started on business. The Official Receiver is the trustee, and he will wind up the estate.

Re W. F. Warr.—At the London Bankruptcy Court an application was made to Mr. Registrar Linklator for the order of discharge of William Frederick Warr, described as a jeweller and watchmaker, of Barnwell Road, Brixton. The accounts showed liabilities of £694 17s. 11d., nearly the whole of which is due to Birmingham creditors. Mr. Aldridge presented the Official Receiver's report, which set forth that the estate would probably realise £117, and that a dividend of about 1s. 4d. in the pound would be declared. The bankrupt commenced business in July, 1883, and, having no capital at the time, was started by the wholesale houses, who, he states, offered to give him unlimited credit. His business was principally on the "tally" system, and it was his custom to entrust goods to travellers, who sold them on credit to domestic servants, mechanics, and people in poor circumstances. The failure was attributed to losses through alleged defalcations by travellers, which he put at several hundreds of pounds, to a loss of £50 by a burglary on his premises, to bad debts, and badness of trade. There was only one offence charged by the official receiver—viz., that of insufficient book-keeping within the three years immediately preceding the bankruptcy. Mr. Myers attended the sitting on behalf of the trustee, and Mr. Le Voi represented the bankrupt. After hearing the latter in support of the application, the learned registrar decided to suspend the order of discharge for nine months. Order accordingly.

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller and Silversmith, 7, *St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller and Silversmith.*

PRACTICAL HINTS ON OPTICS FOR SKILLED OPTICIANS.

Sir,—The enormous increase of defective sight, as shown by the statistics prepared by the Ophthalmic Hospitals, proves the value of opening a discussion upon this important subject. I agree that every person, who has defective sight, should be treated, or the error of refraction corrected by one who has a knowledge and experience in the use of lenses and the error which has to be corrected. It is something which can be acquired, and there are many works written and published by eminent specialists valuable to students, being printed in simple language, which anyone of ordinary intelligence, having the desire, can master; among which, I would mention "Helm's Refraction," "Hartridge's Refraction," "Carter's Eyesight, Good and Bad," "Carter's Diseases," all of which give exhaustive accounts of the various symptoms and diseases and the method of proceeding to correct, by optical means, the errors of refraction. With the assistance and study of any one of these works it is possible to gain a knowledge which would help to cultivate a trade which is fast growing and which is a most remunerative branch to a watchmaker's business.

Yours truly,

13, Spencer Street, Clerkenwell. A. E. Grey.

The Watchmaker, Jeweller and Silversmith.

Edited by D. GLASGOW, Jun.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. The Watchmaker, Jeweller and Silversmith will be found an exceptional medium for advertising. Special Notices, Situations, &c., per insertion, 1s. for two lines, prepaid.

Address all business communications to the Publishers,
Messrs. TRUSLOVE & SHIRLEY,
The Watchmaker, Jeweller & Silversmith,
7, ST. PAUL'S CHURCHYARD, LONDON.

Agents for New South Wales and Queensland:—
Messrs. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

In an able article on French Ecclesiastical Orfèvrerie at the Paris Exhibition (one of a series on the jewellery exhibit) contributed to the pages of a Birmingham contemporary, the writer, after acknowledging the genius of French goldsmiths, says that symbolic art in France, as evinced by its exposition, is almost extinct, and that the French artist has mainly given up symbolic art in favour of æstheticism. These remarks afford food for serious reflection to our home workers. In what direction are we on this side of the channel trending? In so far as regards the work of the goldsmith proper, superficial observation would lead one to think that the tendency now-a-days is entirely in the direction of symbolism, to the neglect, perhaps, of other qualities in the work produced. But in this respect the goldsmith is not altogether a free agent. Municipal, ecclesiastical, masonic, and other badges and insignia are of necessity symbolical, whatever be the meaning of the emblems embodied, and whencesoever their derivation (whether they are emblematical of amusements of clubs, or official positions, or are merely the outward and visible manifestations of esoteric imaginings on the part of the authors or designers), and in comparing modern French and English art productions with one another, we would more especially suggest a consideration of the difference between the smaller jewellery produced in the two countries.

Let the intelligent jeweller make a round of visits to the principal London shops and inspect the various specimens of, say, diamond mounted work, for example, and then (after he has got what should be a good idea of the style of work manufactured by some of our leading firms) let him visit the French section of the Paris Exhibition that is devoted to jewellery; or, if he cannot manage this, let him do the next best thing for the purpose, and read up the published accounts of that exhibit.

We venture to say that, in either case, the result will be of the nature of a revelation to him in one respect at least, and that will be in the opening of his eyes to the immeasurable distance the French are ahead of us in the æsthetic qualities of their work. In the first case he will see (with a few notable exceptions) beautiful stones, splendidly mounted in a number of geometrical designs, all of which are more or less repeated in the larger objects, but as for any combinations of colour or artistic designs—none. A few colourless sprays of the Prince of Wales's feather type seem to be the uttermost limits to which our manufacturers are permitted to stray. In the French jewellery, on the other hand, fancy appears to run riot; birds, beasts and fishes, flowers and fruit, in every imaginable combination are to be seen, coloured stones and enamel being largely drawn upon to carry out the effect.

The masterpieces of Bapst, Richstadt, Boucheron, and others would indeed be a revelation to some of our home workers who have no conception of anything beyond what can be seen in Bond Street. We ask a leading manufacturing jeweller: Why is this? Cannot English jewellers turn out work of a similar character, or is it that they are content to take a back seat in the matter of complicated design, and acknowledge the superiority of the French artists? "No, it is not that," is the reply, "nothing but work of the set kind alluded to will sell to the great majority of English shopkeepers, and the public look upon anything else as *outré* and vulgar, and won't wear it." *Voila tout.* The sooner the public are educated up to the point of not regarding the wearing of artistic jewellery as *outré* and vulgar, the better it will be for the trade here, say we, and we should strongly advise English jewellers to make the attempt at once. No time could be more favourable than the present for achieving so desirable an end. What with Shahs' visits, royal weddings, presentations, &c., "louder" jewellery is more in vogue; and if manufacturers would only carry sufficiently varied stocks, and, disregarding the conservative notions of some of their purchasers, go in for higher art (not forgetting enamelled work and coloured stones), and persistently "push" new designs and combinations, the result, we are sure, would soon be satisfactory. English "fashionables" are buying French jewellery of the designs which are supposed to be tabooed here. Why shouldn't home manufacturers take an innings?

Charges of Fraudulent Bankruptcy. — Joseph and Frederick Bromage, manufacturing jewellers, of Summerfield Crescent, were committed to the Assizes on the 22nd ult., by the Birmingham stipendiary, on various charges under the Bankruptcy Act. The defendants were charged that within four months of their bankruptcy they disposed of, other than in the ordinary way of trade, a large quantity of jewellery obtained on credit; also with destroying and falsifying books and documents. W. F. Dick, jeweller and factor, late of Vyse Street, who had business relations with the other defendants, was also charged with various offences under the Bankruptcy Act; but the case against him was not concluded, and will be continued. The three defendants will also be charged together with conspiracy to defraud.

GENERAL NOTES

If you want to know the time, ask a policeman!

A New Observatory Site.—Sir Edward Watkin, M.P., the purchaser of Snowdon, has offered a portion of it to the Royal Observatory as a site for a branch observatory.

Mr. W. G. Fretton, F.S.A., who was at on time the editor of the *English Watchmaker*, published in Coventry, has been reappointed local secretary for the Society of Antiquaries for Warwickshire.

Infringement of a Trade Mark.—At the Bombay High Court in June last, the Waltham Watch Company obtained a decree by consent restraining Mr. George A. Charpie from using their trade-mark "Riverside" on watches.

Robbery of £150 worth of Jewellery.—Robert Meccock was sentenced to ten years' penal servitude last month for burglariously stealing jewellery to the value of £150, the goods of Mr. C. Rider Richardson, of 12, Ely Place.

The President Street Receiver.—"If there were no receivers there would be no thieves" is a trite but true saying, and many of our readers will doubtless hear with a certain amount of satisfaction that since we went to press last month, Mr. Robert Harris, "watchmaker," the receiver in the Highgate, Manchester, and other burglary cases, has been placed out of the way of temptation for the next ten years.

The Murder of a Pawnbroker's Assistant.—Information has been received by the Preston police that a gold watch stolen from the pawnbroker's shop at Atherstone last month, when the assistant was murdered, has been pledged in a neighbouring town. The watch has been identified and the pawnbroker gives a clear description of the man who pledged it. He would be able to identify him.

The chief attraction of the Belgium Section of the Exhibition is a diamond cutting machine, and on the President's visiting this Section, the artisans working with this machine had arranged a quantity of large diamonds of the purest water into a trophy representing a laurel crown, with a bundle of axes bound together, to symbolise union is strength. Above were the letters R.F., and below the words "Vive Carnot!"

Instruments.—It is a good sign when mathematical instrument makers are busy, as new enterprises are almost always in view when large orders for instruments are being given out. We have been informed, says *Industries*, by one of the leading firms of instrument makers that they have not been so busy for six years. Just recently they received an inquiry for £350 worth of theodolites, levels, and cases of drawing instruments, the whole being wanted for shipment to the East.

Statuette of the Marquis of Exeter.—The equestrian statuette presented to the Marquis of Exeter by past and present brother officers of the Northamptonshire Regiment is now on view at the Grosvenor Gallery, where it will remain till the end of the season. It was carried out in silver by Messrs. Hancocks & Co., of New Bond Street, after the model from the life by Mr. C. B. Birch, A.R.A., and is an exceedingly life-like representation, creditable to both sculptor and silversmith.

C. O. D.—Mr. G. W. Frodsham, of 4, Change Alley, Cornhill, suggests, in the *Society of Arts Journal*, a postal reform on the lines of the French *Envoi contre remboursement* system. He thinks it would afford increased facilities for trade, were it possible to send goods through the Post Office to persons who had ordered them (through advertisement or recommendation), payment to be made to the agent of the Post Office and remitted, less a commission to the sender of the goods. Why not?

The Goldsmiths' Company and the South London Polytechnics.—In November last we announced that the Goldsmiths' Company had come to the assistance of the South London Polytechnics with the offer of an annual endowment of £2,500 and the gift of land and buildings, at New Cross, of the value of £85,000. Since then they have had an accession of income, and they now propose to take the whole charge of this Polytechnic, which means a capital expenditure of between £150,000 and £200,000.

The Shah's Presents.—West End tradesmen, says an evening paper, are disgusted with the Shah. Several Bond Street jewellers went day after day to the Palace in the hope of seeing him. But he never turned up, and the tradesmen came away angry and hungry, after a day of weary suspense. The Shah brought over a heap of Persian jewellery and one or two jewellers. The disappointed tradesmen say that it is the mission of the Persian jewellers to depreciate everything English. They laugh scornfully at the idea of "a handsome present from the Shah," when all that he has bought in London is £200 worth of watches.

From over the Sea.—Arthur Latham, otherwise Edwards, the absconded jeweller (erstwhile of Newcastle-under-Lyme, but later of Bridge Street, Abingdon) who was being brought home from Hobart Town, Tasmania, in charge of Superintendent Rowbotham, jumped overboard at Rio de Janeiro while the ship was coaling, and either escaped or committed suicide; it is not known which. Anyhow, as the Superintendent has brought back most of the purloined jewellery, those Birmingham firms who had pluck enough to guarantee the expenses incidental to the extradition business, have cause to congratulate themselves on their action in the matter.

English Clocks at the Paris Exhibition.—Messrs. Gillett & Johnston, of Croydon, are putting up clocks in the Eiffel Tower, at the British entrance of the Exhibition, Avenue Rapp, in the Machinery Hall, and in the American Section. As noted by our Paris correspondent last month, they have a small exhibit of interesting models of church, turret, musical clocks, bells, and carillon machines in the British Section of the Industrial Court; but, wishing to show on a larger scale than the limited space allotted them allowed, they are now putting up a double-faced clock at the entrance of the vestibule of the British Section, and are proceeding with those for the Machinery Gallery and the Great Tower.

The Plate Duty.—Messrs. J. Thredder, Son & Co., 25, Great Tower Street, S.E., write:—"A great deal has been written to the public Press respecting the silver plate duty and its reputed impediment to trade. It, however, does not seem to be generally known to manufacturers, traders, and others (nor does the Postal Guide give the information) that in order to facilitate the exportation of small parcels of silver plate (new and never used) the Lords Commissioners of her Majesty's Treasury granted our petition in June, 1887, to be allowed to export by Foreign and Colonial Parcel Post silver plate for drawback, in packages within the regulation size and weight. We shall be pleased to give further information upon application."

Hall-Marking.—The President of the Board of Trade (Sir M. Hicks Beach), has, at the request of Mr. Edward J. Watherston, promised to obtain at the hands of British Consuls abroad, full particulars relating to the practice of Hall-marking, and the laws and regulations under which gold and silver plate and jewellery are manufactured and exposed for sale in every continental country. The object in view is to prove that foreign countries neither want our standard nor our Hall-mark, and that, if British manufacturers ever wish to export plate for sale abroad, the law of "compulsory" Hall-marking must be repealed. It is hoped that these consular reports will be published prior to the Parliamentary Session in 1890.

Mr. Jabez Jackson, of Vine Street, Coventry, and of the Coventry Technical School, has been awarded second prize for work exhibited at the recent Industrial Exhibition held at the People's Palace, Mile End. His exhibits comprised spring and pivotted detent chronometer escapements; lever escapements having equi-distant lockings and circular pallets; club-tooth; non-magnetic, and other escapements. A feature of this exhibit was a display of interchangeable escapements, the whole of the exhibit being made to drawings executed at the Coventry Technical Institute by the exhibitor. A variety of tools of special construction and specimens of precious stones, in various stages for jewellery purposes, completed a very instructive and interesting show case.

A new Disease Produced by the Electric Light.—A Russian professor has just published a report stating the result of a ten years' experience respecting the effect of the electric light on the eyesight, and from which it appears that persons who are constantly occupied near electric lighting machines become affected by a malady which may be designated as "electric ophthalmia." The symptoms of the disease only declare themselves during sleep, when the patient is awakened by a running from the eyes, sharp pains behind the eyeballs, and, for the time being, an intense dread of seeing light. After one or two hours these symptoms disappear, and the patient is again able to fall asleep, but always wakes again with a feeling of prostration. This new disease is attributed to hyperœmia of the optic nerve and the lesion of the nerves of the cornea.

The Paris Exhibition.—On the occasion of President Carnot's visiting the British Section of the Exhibition last month, he set going the big clock which has been put up there by Messrs. Gillett and Johnston, of Croydon. The persons who accompanied the President were subsequently entertained at lunch by Mr. and Mrs. Johnston, at the Restaurant Russe, on the first platform of the Eiffel Tower. Another big clock, also made by Mr. Johnston, was inaugurated with the same ceremonial as that in the Machinery Hall. This remarkable timepiece was happily erected after strong opposition on the part of the authorities. After it had been put in its place the first time a peremptory order came from high quarters for its removal. It was feared that the works would be too heavy for the timbers of the Restaurant Russe. It was only after long negotiations that the resistance of the administration was overcome, although it yielded with a good grace, sending a representative to attend the inauguration.

The Depreciation of Silver.—In the House of Lords, on the 26th ult., the Earl of Northbrook, calling attention to this question, said that it seriously affected the junior classes of Civil Servants in India, and he urged upon their lordships to adopt one of the remedies suggested by the Royal Commission on the subject, viz., the removal of the duty on silver plate; the effect of which would be to increase the production in this branch of industry, and consequently to create a larger demand for the metal and an enhancement of the price. He was of opinion that it would benefit not only India, but this country also. Lord Stanley of Alderley and Lord Herschell supported the view of the noble earl. Viscount Cross said, that he had for some time endeavoured to get the duties taken off; and he should continue to press the Chancellor of the Exchequer and leave him no peace until he could induce him to find means to abolish the duty, and also to modify the Hall-marking regulations, so as to facilitate the introduction of Indian silver into this country.

The Elgin Watch Company.—Recent advices from the States state that the rumoured offer by an English syndicate to purchase the Elgin Watch Factory was a complete fabrication. The publication of the rumour in several daily papers is said to have caused quite a hubbub at Elgin, Ill., where it took the people by surprise. Both President T. M. Avery of the company, and E. J. Scofield, their eastern representative, denied point blank any foundation for the rumour, and asserted that the whole was a fabrication pure and simple. The figures (£1,600,000) that were reported as offered, alone, should have warranted immediate disbelief in the report. The capital stock of the company is £400,000, 2,000,000 dols., the assets showing the stock to represent 1,666 per share. It is natural to suppose that the stockholders are, under these circumstances, only too anxious to hold on to the shares. The report is said to have had its origin in the statement made at the annual meeting of the stockholders at Chicago that an agent of an English syndicate had asked President Avery what the factory could be bought for.

Trial of the Pyx.—This annual trial took place last month at Goldsmiths' Hall, and considering that the amount of coinage for the year ending June last was very much above the average, the result is wonderfully near to the standard. It is enacted that one coin out of every 15 lb. troy weight, of gold, and one coin out of every 60 lb. weight of silver, struck at the Mint, shall be held over for the purposes of this trial, and as the coinage from July 1, 1888 to June 30, 1889 amounted to £7,921,303, gold (all sovereigns), and £1,111,988, silver, the accumulation in the Pyx reached 11,300 sovereigns, and silver of various denominations to the value of £555 17s. 5d. The assaying tests are of a very severe character, and a number of coins taken from the Pyx at random are dealt with separately, being assayed both by fire and "touch." Afterwards the residue is tested in bulk as to fineness and weight. The standard fineness for gold coins is 916·66, and the coins tested came out respectively, 916·80, 916·86, 916·76, and 916·70. The standard for silver is 925, and the result of this test was an average of 925·2. Perhaps it is not generally known that the word "Pyx" furnishes the root of "box" from the Greek and Latin "Pyxis."

The Diamond Market.—With the high prices ruling for *rough* stones, one month's report of the *Amsterdam* market would very well do for another. Notwithstanding their outcries about the iniquity of the dealers, syndicates and others, who are charged with forcing and keeping up the quotations, however, the *Amsterdam* cutters cannot have so very much to complain of. Their factories are reported to be sufficiently busy, and if, as *De Diamant* says, the present condition of things necessitates the putting in of good workmanship in order to effect sales, it is only what every other trade is experiencing now-a-days.

Paris being full of visitors, it goes without saying there is a good deal of business transacted, and as the American demand seems to be stimulated, if anything, by the presence of numerous compatriots in the French capital, it may be expected that later reports from the diamond mounters will be somewhat more cheerful for some time to come.

The *London* market received the usual consignments from the fields, and a medium business was done throughout the month, so that, should a reduction in the prices take place, and the present good demand for *rough* continue, an undoubted rush may be looked for.

Metals.—*Silver*—Bars, 42$\frac{3}{16}$d. : *Copper*—Chili bars, good ordinary brands and G. M. B's., cash, £41 7s. 6d. to £41 15s ; *Tin*—Fine foreign, Straits, £88 12s. 6d. to £89 2s. 6d. ; Australian, £88 17s. 6d. to £89 7s. 6d. ; *Spelter*—Ordinary brands, £19 5s. to £19 17s. 6d. ; special, £19 7s. 6d. to £19 10s. ; English soft, V. & S., £19 15s., Swansea. *Quicksilver*—Importers' price, £9 5s., second-hand holders, £8 17s.

TRADE NOTES

Messrs. Mappin & Webb announce that the business of Messrs. Stephen Smith & Son, which has been carried on by by them for several years at King Street, Covent Garden, has been removed to their premises in Oxford Street, where they will carry on the designing and manufacturing of testimonial and presentation plate as heretofore.

Automatic Sight-Testing Machine.—Messrs. Woodhouse and Rawson, the well known manufacturers of electrical and scientific apparatus, are introducing a novelty which should have a considerable stimulating effect on the spectacle sellers' business. This is no less than an automatic optometer, by means of which, at the trifling cost of one penny (the humble "d" as a contemporary facetiously puts it), the public can be gratified with a knowledge of their focal distances. The invention is due to the genius of a Mr. B. G. de Woolfson, and the object is stated to be "to enable people to take an exact measure of their optical powers and gauge their defect previous to investing in eyeglasses." Graduated lenses are arranged in circular form, and on dropping a penny into the slot these can be turned until the test type at the back of the machine is seen at its clearest by the inquiring investigator. A drawer containing order forms is attached to the machine, and the operator, having ascertained his "correct sight," or what he thinks is such, which comes to much the same thing, can make a note of the number registered and forthwith proceed to the nearest optician's with his order. Judging from the run on the multitudes of other "drop a penny in the slot" machines, the importance of the sight should make the present innovation very popular. It might with profit be taken up by retail opticians themselves, who, by placing one of these machines in a convenient situation in the front of their shops or windows, or by calling attention to it in some way, would be provided with a great additional attraction.

Key for Prince Albert Victor.—A handsome key was presented to H.R.H. Prince Albert Victor on the occasion of his opening the Harrogate Bath Hospital, and was made by Messrs. T. and J. Bragg, of Birmingham, on the part of Mr. A. Fattorini, of Harrogate. The head of the key is an elaborate vesica shape, open at the end. The obverse is occupied by the arms of H.R.H. Prince Albert Victor, given in correct heraldic colours in enamel, and is surmounted by the royal crest. At the sides are shown York roses in enamel. The arms and crest of Harrogate are shown in enamel on the reverse : above this is given an Æsculapian staff twined with a serpent and surmounted by the cock. Below the shield bearing the arms there is an enamelled ribbon having the words "Harrogate Bath Hospital." The head is joined to the column of key by a beautiful Gothic capital, and below are a series of rich mouldings. The whole has been carried out in the best possible style, and is cased in velvet, the lid having a shield bearing the following inscription :—"Presented to H.R.H. Prince Albert Victor, on the opening of the Harrogate Bath Hospital and Rawson Convalescent Home, July 18th, 1889."

On the same occasion a beautiful gold brooch in the form of a key was presented to Miss Rawson, the principal benefactor of the Home. The head of the key is heart-shaped, indicative of charity, having a cross of faith above it, and the anchor representing hope—the three Christian virtues. It is formed by a flowing ribbon, on which is enamelled "Harrogate Bath Hospital and Rawson Convalescent Home." The arms and crest of Harrogate are given in correct heraldic colours on the centre. The head of key is joined to the column by a Gothic capital. The column is in the form of an Æsculapian staff, with serpent twining around it. The initials of Miss Rawson are also given on the column. The key is finished in the best style. The following inscription is given on a shield on the case : "Presented to Miss Rawson, on the opening of the Harrogate Bath Hospital and Rawson Convalescent Home, July 18th, 1889."

The workmen and apprentices of Messrs. Botwright and Grey, manufacturing opticians, of 13, Spencer Street, Clerkenwell, were awarded among them seven first-class certificates for the excellence of their work in steel spectacles and eyeglasses exhibited at the People's Palace Exhibition, recently closed.

Messrs. J. and H. Taylor, manufacturing opticians, have purchased the business lately carried on by Mr. H. Collis, of Vittoria Street, and have transferred the same to their address, 54, Tenby Street North, Birmingham.

Messrs. Keat and Co., 214, Goswell Road, have forwarded us some catalogues and price lists which afford some very interesting reading. Special attention is called to their jobbing department; all manner of watch and jewellery repairs, electroplating, engraving, gilding, etc., are undertaken by the firm, and country watchmakers and jewellers would do well to write for these catalogues.

The Clerkenwell Manufacturing Jewellers', Silversmiths, and Watchmakers' Association, of 5, Hatton Garden, E.C., have now on view a presentation silver set which is worth inspection. It consists of a centre-piece and two side pieces. The suite weighs nearly 350 oz., and its value is £225; it symbolises music and art by means of appropriate female figures in the centre-piece, and cherubims in the smaller pieces. The brackets are constructed to form a candelabrum, or fruit and flower holders at will. The figures are well modelled, and the whole is a very fine specimen of the silversmith's art.

Board of Trade Returns.

THE clocks and parts thereof imported during the month reached the value of £32,913, in comparison with £36,744 in the same month of last year, and £30,712 for that of 1887. The following shows the sources of the supply:—

June	1887.	1888.	1889.
From France	£14,371	£16,609	£13,418
„ United States ...	£7,365	£6,096	£6,143
„ other countries ...	£8,976	£14,039	£13,352

The six months of this year show a total of £210,449 in value against £222,753 in the same period of last year, and £187,601 for the first six months of 1887.

The watches and parts thereof imported during June are valued at £51,991, and in the same month of last year the amount was £61,029. The June of 1887 showed a record of £61,284. The watches imported for the first half of this year reach the total value of £342,862, and in the same half of last year it was £285,885, while in the same period of 1887 the value was £361,160.

The plate and plated and gilt-wares exported during the same period reached the value of £30,299, against £33,322 in the same month of 1888, and £22,505 in that of 1887. For the first half of this year the exports in this line show very favourably, the value being £189,467 in comparison with £172,013 in the same period of 1888, and £134,881 in the same half of 1887.

The total value of imports of every kind of produce for June is valued in the Board of Trade Returns at £29,294,015. In the same month of last year it was £30,478,854, and in that of 1887, £27,555,217. For the six months of this year the total value is £207,737,735, while for the same months of last year the imports were £189,729,707, and for the first six months of 1887, £178,867,159.

The exports of British and Irish produce for June reached the value of £18,612,506, in comparison with £19,042,845 for the same month of last year, and £17,320,441 for the June of 1887. The first half of this year gives a total value of exports of £118,987,943 against £112,717,945 in the same period of last year, and £104,295,890 for the first six months of 1887.

BIRMINGHAM NEWS

From Our Correspondent.

Although a considerable amount of grumbling is just now being indulged in by most of our manufacturers in jewellery, in consequence of the continued competition in all branches, yet I find upon enquiry that most houses are running full time, although in a good many instances upon stock—orders being somewhat scarce; but as a stock of jewellery is soon put together now-a-days with the improved methods of working, it is clear that sales must be fairly numerous, or otherwise stocks would become so large that "short time" would be the result. As a point of fact, there is no doubt that there is more jewellery made and sold in Birmingham at the present time than has ever been done in the history of the trade; the keen competition and rapid production being the actual causes for complaint, and not the want of demand. It is a notable fact that since jewellers have taken to pushing their stocks about the streets on hand-carts, like the costermongers and fruit-sellers, there has been a corresponding rise in the amount of grumbling indulged in, and this, like a number of other complaints, is very difficult to cure, and more especially so as it is next to impossible to remove the cause.

* * *

The demand for Hall-marked work is on the increase, both for gold and silver goods. Several large orders have come to hand during the month for 18-carat gold solitaires, Hall-marked. This is a rather exceptional line in solitaires, and is one of the numerous evidences which are coming to hand of late that the public are asking for a guarantee of the quality of goods supplied to them. The trade generally regards this as a good omen, and will be glad to see more Hall-marked work to the front. In order to meet the increased demand, the Assay Office authorities here have issued a new list of prices for marking, at reduced rates. In some instances (although the difference is small) the benefit derived by the manufacturer will be considerable. One of our leading watch manufacturers estimates that it will save him about £50 per annum in the marking of his silver cases. The alteration is, I understand, largely due to the representations made to the Assay authorities by the Jewellers' and Silversmiths' Association. A copy of the revised Assay tariff will be found appended. The Association has an eye to all or any subjects connected with the trade which are likely to be of any interest or importance to its members; and, in accordance with this rule, and in order to be thoroughly posted up in the actual position of the members of the trade who are likely to be affected by the abolition of compulsory marking—should such a thing take place—the Association issued a circular on July 9, containing the following queries, the answers to which they hoped would enable them to form an intelligent and reliable idea as to the position of makers in relation to this question.

1—What articles of jewellery do you manufacture which are *subject* to the payment of duty and to compulsory Hall-marking?

2—Is it clearly defined, and can you easily ascertain what wares are liable to duty and what are free?

3—Does compulsory Hall-marking seriously operate against your foreign trade?

4—Do you experience any difficulty in recovering drawback on goods exported?

5—In your opinion would such an addition to the present exemptions list as would include all articles of jewellery properly so called, and all personal requisites, such as pencil cases, card cases, match boxes, &c., &c., be sufficiently comprehensive as to generally satisfy the trade?

The answers to these questions will be a means of assisting the Association as a body in forming plans of campaign and thus to give instructions to committee, &c.; it is clear that they mean business, and additional members and increased funds will be very acceptable.

* * *

There is a general expression of great satisfaction at the arrest of Messrs. Dick & Bromage. The circumstances of the bankruptcies of these gentlemen are well known, and all concur in hoping they will get their deserts at the assizes, which said deserts are estimated at a good figure; but there appears to be a considerable difference between legal possibilities and moral responsibilities, so that the result is somewhat a matter of dispute, and, in fact, I understand that there is a book being made on the event and considerable odds have been given and taken on both chances. Well, "it is an ill wind that blows nobody any good," and perhaps some "poor devil" may make a good thing out of it yet; I make all haste to congratulate the gentlemen upon their spirit and also upon their "sportsmanlike form." I hope that the losers "will come up smiling" when time is called.

* * *

The Electrical Exhibition, Bingley Hall, Birmingham, will be opened by the time this has gone to press, and judging by the list of exhibitors and the arrangements that are now near completion, a very interesting and successful affair it will prove. The exhibits consist so largely of mechanical inventions and productions that it is not very surprising to find that the jewellery trade is scarcely represented, the firms that have taken space being chiefly noted for small mechanical novelties in metal, &c., and scarcely coming under the head of jewellers proper; at any rate, there will be nothing nearly approaching the goldsmiths' exhibit and that of Mr. W. Spencer in diamond mounting shown at the last Bingley Hall Exhibition.

* * *

In walking round the jewellers' quarter, Birmingham, one cannot help noticing that Vyse Street is becoming the fashion, and that manufacturers are gradually taking up their diggings there, and some of them extending. The last comers are the well-known firm of goldsmiths, Messrs. Jones & Lee, who have just removed from 69, Spencer Street to 114, Vyse Street. They have long enjoyed the reputation of making good and artistic gold work, well finished, and of sterling quality, some designs executed in gold and inlaid with figures and animals in platinum, which Mr. Jones was good enough to show me, being especially fine.

* * *

The well-known house for cheap diamond work, Messrs. Wright & Hadgkiss, Vyse Street, are extending their premises, and making room for another eight workmen. They make a cheap class of diamond work of pretty design at popular prices, and thus cater for a class of customer that I presume has hitherto been unable to afford the genuine article. Their weekly output is, I understand, very considerable in this particular class of work, and their staff of workpeople being now increased to 70, they will be able to meet some large demands. Although several other houses have started in this class of goods during the last few years, there still appears to be an increasing demand for the same, in contradistinction to the other and more expensive class of gem work.

Assay Office, Birmingham.—Prices to be paid for assaying and marking gold and silver wares on and after July 6, 1889. *Gold*—For each single Albert chain, consisting of one row of links, 5d.; for each other chain, 10d.; for each watch case, 5d.; for each locket, bracelet, or necklet pendant, 2d.; for each dozen studs, or links, or rings, 3d.; for other wares, each, 1d. *Silver*—Wares not exceeding in weight 5 dwts. each (excepting watch pendants), per dozen, 3d.; Chains, per oz., 1d.; other wares, ½d. per oz. Fractions of a penny in the accounts will be charged a penny, and no parcel of gold or silver work will be charged less than one shilling. The full weight of gold and silver will be returned without stoppage for diet.

SHEFFIELD NOTES

From Our Correspondent.

The shareholders in Martin, Hall & Co., Limited, are this year the happy recipients of a dividend of 9 per cent. When it is remembered that some of the "heavy" limiteds have only paid 5 per cent. this year, this speaks well for the silver trade. During their 23 years' existence as a limited company, Martin, Hall & Co. have paid out of profits the goodwill, divided amongst the shareholders an average of 10 per cent. for the whole period, and established a reserve fund of £10,000. When it is considered that more than half of this period has been one of very great depression in the general trade of the country, this record will be seen to be a particularly good one.

Another attempt has been made, but without success, to induce the Board of Trade to concede the principle of the appointment of a public prosecutor under the Merchandise Marks Act. Two or three years ago a very strong feeling prevailed in Sheffield against the practices which this Act was designed to frustrate. The agitation then set on foot united men of all parties and resulted in the passing of the Act which has already been productive of a great amount of good. It is felt, however, that something more requires to be done, and that prosecution under the Act should be undertaken by a public official. It is considered to be unfair to throw upon a private individual, who is always liable to the imputation of unworthy motives, the discharge of what is obviously a public duty. At a recent meeting of the Chamber of Commerce the decision of the Board of Trade was communicated to the members, who, however, unanimously passed the following resolution:—"That this Chamber still entertains the opinion, already expressed by them, that prosecutions under the Merchandise Marks Act, 1887, should be undertaken by the Public Prosecutor."

The report of the Master of the Mint just issued shows a very large increase in the returns of silver assayed in Sheffield during the past year. There is no getting over this testimony to the general prosperity of the country. The same returns show the increase in the quantity of gold assayed at Birmingham to be of an equally satisfactory character. These two facts taken together show that the people who wear jewellery are buying gold rather than silver, and also that plated ware is to some extent being displaced by sterling silver. Long may this state of things continue.

In common with several other centres of industry, Sheffield has been honoured by a visit from the Shah, and his Imperial Majesty has expressed himself as highly pleased with his reception. The reception of the Master Cutler, held in his honour, was a most brilliant affair, not the least brilliant feature of it being the mass of jewels which adorned the person of the Eastern potentate. Several of the large works in town were visited by His Majesty and suite, among others the silver and electro-plate works of Messrs. James Dixon and Sons, of Cornish Place. The appearance of the spacious quadrangle around which the works are built bore striking testimony to the horticultural tastes of the workmen in the silver trade, every window sill being decorated with flowers grown in the gardens which they cultivate in their spare time. The Shah seemed much interested in the show-rooms of the firm and made some rather extensive purchases from the stock. Contrary to expectation, however, he did not visit any of the workshops, which seems to show that whatever other excellencies he may possess as ruler of a half-civilised state, Nasr-ed-Din is no Peter the Great. All the same he has the appearance of having his "head screwed on," and not at all the savage he is made out to be by some of our London correspondents.

A London company has given notice to the Town Council that they intend to apply for a provincial order to supply the electric light in Sheffield. I don't suppose the general community will object, but whether the shareholders in the company in question will be much benefitted by the step is another question. Sheffield already pays less for its electric light than any other large town, and the new-comers will certainly have to run at a loss if they are to compete with the local company. The experience of the National Telephone Company, which is pouring out money like water in a vain attempt to crush the Sheffield Telephone Company, ought to be a warning to all "foreigners" to keep clear of Sheffield. I don't suppose it will, however, and after all the directors ought to know their own business best. As I hinted before, whoever loses by the step it won't be the shop-keepers of the town—in the first instance at all events.

An interesting trade-mark case has just been decided in the Chancery Division of the High Court of Justice before Mr. Justice Kay. The famous cutlery firm of Joseph Rodgers and Sons, of Norfolk Street, sought an injunction against Mr. Rottgen, a German manufacturer, to restrain him from striking a trade-mark which was a colourable imitation of that of the plaintiffs'. As a rule, the law of England seems to be framed with the express object of allowing as many criminals to escape as possible. There is no such nonsense however about the Merchandise Marks Act. The defendants in this case could plead that while Rodgers and Sons' mark was a cross and a star, their's consisted of two crosses. They might have argued too that although their label was of the same colour as that of the plaintiffs', and set out in the same manner that the letterpress upon it was different—it being no fault of theirs that the name Rottgen bore a superficial resemblance to Rodgers. The injunction was granted nevertheless, and accompanied too with some severe strictures from the judge. As a matter of fact the similarity of the two trade-marks was seriously affecting the trade of the Sheffield firm in India, where a large proportion of their business is done.

A former battle of a similar character which Messrs. Rodgers and Sons had to fight partook somewhat of the grotesque. It must be understood that Joseph Rodgers and Sons is a gigantic concern in Norfolk Street, everything about it having an air of dignity. A small cutler, however, opened a shanty not very far off, having a sign over the door with the words "Joseph Rodgers and Sons, cutlers," upon it. It was not disputed that his name might be Rodgers, and possibly it was Joseph, but it was clearly proved that the public were under the impression that they were buying the goods of the great Joseph Rodgers, when they were only getting those of the little Joseph Rodgers, and consequently the little game of the latter was summarily spoilt by a legal process.

The general trade of the town continues to be prosperous. The price of coal is going up and the large steel houses have not been so busy for years. The silver and electro-plate trades, however, have reached their usual dead season, but are no worse off than they expect to be at this time of the year. On the whole, manufacturers have cause to congratulate themselves. The results of the past twelve months' working have been substantial and the prospects for the future are good. They may now, therefore, with an easy mind, betake themselves to Scarboro', Whitby, or the Isle of Man, and this is precisely what they are doing.

People here are beginning to admit that all German manufactures are not "trash." Although Sheffield feels the results of their competitions more in the cheaper class of goods, yet it is evident that the Germans are displaying an amount of business aptitude and enterprise that will have to be reckoned with in the future. The latest German idea, that of a floating exhibition, is going to take definite shape after all. Its promoters intend that it should "pay," not only as an advertisement for the national manufacturers, but as a commercial speculation in itself.

The manner, too, in which young German business men are going in for oriental languages makes it plain that the old easy-going times are gone for ever. Markets that we have hitherto considered our own will have to be fought for over again. In point of fact the struggle has already commenced in our own Indian Empire.

Midland Jottings.

By W. K. P.

ALTHOUGH things generally are looking very bright in the Midlands, jewellers are complaining of a lack of regular orders. Special lines are still the order of the day, though there is nothing very startling even in specialities to record this month. The shipping markets are for the most part restricted and in one direction; the drought in Australia may have contributed to this effect, for any disaster or unusual occurrence in The Antipodes is speedily felt at home by merchants and manufacturers. The Cape markets are still good, but it is the cheap and light stuff which is exported there—stuff which will produce the maximum of rough effect at a minimum cost. There is not much to grumble at in the electro-plate trade. Watchmakers report trade brisk, but firms in the optical trades complain of competition, which is very keen and considerable at the present time. It will be a pity if in a trade like this a system of cutting is instituted, for there is no reason whatever for such a state of things. There is a good demand for this class of work and there is no over supply. Good prices can easily be had, and underselling should be entirely unknown.

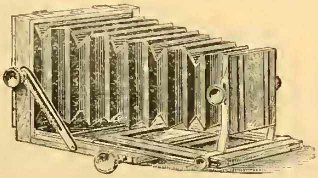
The Dick and Bromage case is creating considerable discussion in Birmingham. It is a remarkable story of alleged fraudulent bankruptcy. Robert James Dick, Joseph Bromage and Frederick Bromage together traded as Dick and Bromage, as manufacturing jewellers and factors. The total amount of their liabilities was £25,000, and the charge was that they attempted to account for a loss of £21,000 in five months, by fictitious losses. It is alleged that invoices have been destroyed wholesale, and entries of a vague and unreliable character made in the books, and in many cases the books have not been posted at all. The Bromages were also charged with pawning goods, and admitted having pawned £17,000 worth, £7,000 worth being their own property, and £10,000 worth belonging to a man named Bernard, of London. As Bernard could not be found, it was suggested at the examination that he was an imaginary character, and that the goods really belonged to Dick. The whole story is long and tedious, as has been the unravelling of their affairs. A warrant for their arrest was issued by Judge Chalmers, and at their solicitor's request they were remanded on their own securities of £500 each and two securities of £250 each. At their further examination they were committed to the Assizes. A strong effort was made to bring the case on at the Sessions, but the stipendiary declined to accept the defendants' counsel's suggestion, and said that the gravity of the case demanded the attention of the higher courts. Mr. Judge Hawkins will be present at the approaching Assizes.

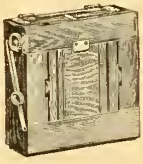
The visit of the Shah, though it brought pretty well of jewellery into the City for the day, the quantity was not increased very largely when his Majesty and suite left in the evening. One of the Persian officials was relieved of his watch by one of the crowd at the station in the morning; but it is said he bought another at a well-known watchmaker's in High Street in the evening before he went away. It was a great farce, the visit of the Shah. The Mint was big with preparation for his arrival, but he never got there. Two hours late for breakfast made all the difference, and the medal which was to have been struck out of new dies, by new tools, by the Shah himself was never struck. It is said there was some disappointment felt at his non-appearance.

Will Birmingham have a Bishop? is the question now agitating many circles, and there seems a probability of it being answered in the affirmative. Coventry is also advancing claims, and has received promises of attention in the near future. It seems quite evident that the Bench upon which Bishops are supposed to seat themselves will have to be considerably lengthened if all these additions in the way of occupants thereof are to become facts. It would perhaps be a good thing for both Birmingham and Coventry to be converted into an episcopal see. Many things would be required which would give a new impetus to manufacture, and altogether it would add to the importance of either city, and serve to aid the rapid growth of the newer of the two. Birmingham has already a Roman Catholic Bishop as well as a Cardinal, and we really think it ought now to have a Bishop representing the Established Church.

I was in Bingley Hall a day or two ago, where all is noise and confusion. Through the din and dust, however, one can see that rapid progress is being made for the opening of the Electrical and Industrial Exhibition, which will have taken place by the time these jottings are in print. Lady Randolph Churchill, who is very popular in the Midlands, as elsewhere, is to conduct the ceremony and she will be supported by most of the Patrons of the Exhibition. In viewing the preparations, one is struck with the fact that everything is being done to make the Exhibition a popular resort during the three months it will be open. An organ is being erected as well as a band stand, while the winter gardens are being pushed forward with all speed. There will be two fountains illuminated by the electric light. The absence of gas will serve to keep the large hall cool in the evenings, and there seems to be every probability that the concerts and other entertainments to be provided will be largely patronised.

Messrs. J. & H. Taylor, of 54, Tenby Street, North, who have purchased the optical business of Mr. H. Colls, of 52, Vittoria Street, and transferred it to their own address, are just introducing to the trade their new "Tourists' and Cyclists' Camera," for which they claim that they have produced at a reasonable cost the lightest and most portable high-class camera yet offered. It folds into a space of only two inches in thickness, and weighs, complete, less than 3lbs. It is made throughout of best seasoned mahogany, and is fitted with best leather bellows, extra long and short focus, by means of a slide and a rack and pinion. The full length when extended is eighteen inches.





The drawings show the camera open and closed. It has a skeleton bottom, and is fitted with all the latest improvements. With it may be obtained the special "Cyclists' Stands," folding into extra small compass. Messrs. Taylor are making quantities of a very pretty opera glass with long handle, which may be had in pretty plush satchels at a small cost. A very cheap barometer in fancy wood is just now being offered to buyers by the firm.

Henry Jenkins & Sons, die sinkers, medallists, stampers, &c., of Unity Works, Vittoria Street, Birmingham, will exhibit a medal press, striking medals to commemorate the Exhibition: also stamps and presses at work showing the processes of stamping and piercing, &c. Patterns framed, showing designs of checks, tokens, labels, &c.; also ornaments manufactured by the firm. Show cases, exhibiting stars, badges, ornaments, decorations, war and naval officers' miniature medals made by them; also a valuable collection of war medals from 1799 to 1887.

Mr. J. W. Tonks (of Messrs. Bragg), who was appointed one of the fifteen jurors at the Paris Exhibition for jewellery, has just returned to England. His work is not quite finished, and he expects that he will have to go to Paris again very shortly. He states that the duties were somewhat extensive, as frequently more than half-an-hour would be spent over one exhibit, which would be taken from its case and minutely examined. The duties, however arduous, are recognised well by the Parisians, and the jurors were fêted and feasted and made much of in every way. England makes a good show of jewellery, and English work is everywhere appreciated as fully as it deserves.

American Items.

The total loss of the retail jewellers of Johnstown, Pa., as reported to the New York Jewelers' Board of Trade, is about 75,000 dols. The heaviest loser is J. Luckland, sen., whose damage amounts to about 50,000 dols.

A very significant paragraph is going the rounds, says *The Waterbury*, concerning the projected watch factory at Otay, California. It is to the effect that every employée is obliged to invest in a house and lot as a condition of his retention. Either this smacks of "real estate booming" or a worse tyranny. Such a proposition may be plausible, but therein are embodied too many objectionable contingencies.

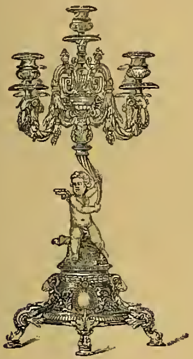
I find, says G. W. Childs, of the Philadelphia *Ledger*, that speculation in mining stock is still rife among merchants and even merchants' clerks. The many miserable frauds which have been placed upon the market, and which are still being placed, does not seem to check the ardour of these speculators. As long as mining stocks can be had for from 5 cents to 50 cents a share it is a great snap for the small "capitalist" to speculate. A half dozen impecunious millionaires will get together, chip in 16 dols. 66 cents apiece, and form a "syndicate" to purchase 1,000 shares of "sucker" stock which is selling at 10 cents, with prospects of a "boom," as private information reports a "strike." But it is the man who sells the stock that makes, while the syndicate waits for the boom which never comes.

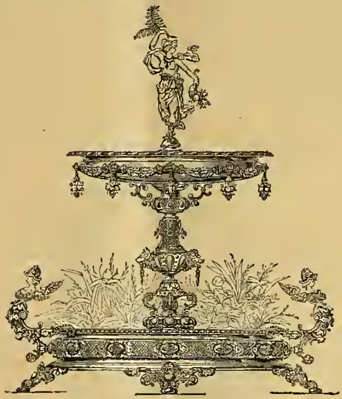
I am a strong believer in the wisdom of vacations. Even if one cannot go "on a trip," he can stay at home and let business take care of itself for a few days or weeks. The true philosophy of a vacation is to be able to throw off the cares of business. The man who vacates with a telegraph wire stringing behind him had better remain at work for all the good his rest will give him. The most satisfactory and enjoyable labour becomes in time monotonous and wearying, and a change is needed. Some people think otherwise, but their sleepless nights and aching heads show that nature knows more than they do.

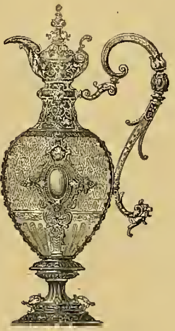
It will not be denied by any thoughtful and observant man that there is a tendency the world over to a shortening of the hours of labour. Like all great industrial changes, the movement has been a slow one, but it is moving faster with the increase of its own momentum. The reform is such a sensible one that it will only meet with the opposition of those who would oppose any change. I expect the time is not far distant when to work more than eight hours per day will be as remarkable as for workmen now to labour fourteen. With the aid of modern inventions, working days of eight hours will supply the world with everything it may need.

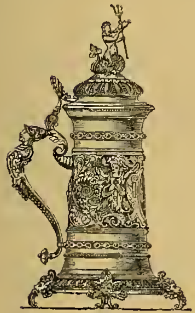
New Gold and Silver Plate.

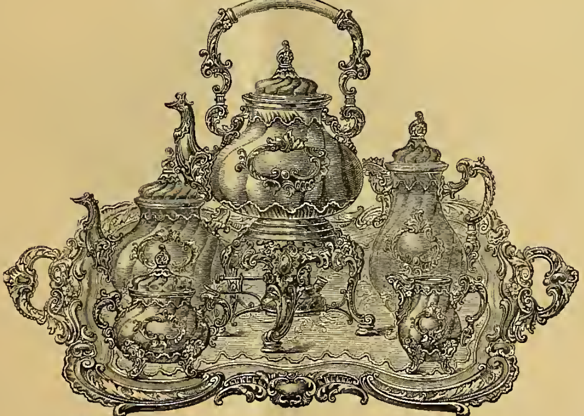
THE accompanying cuts illustrate some new goods, that have just been introduced to the English market by the manufacturers, Messrs. P. Bruckmann & Sons, of Heilbronn. When we say the goods are new, it is necessary, perhaps, to qualify that statement by adding that they are new to this market, although as a matter of fact, their introduction and the opening of a branch establishment at 64, Holborn Viaduct (in the same building as that in which Messrs. Backes & Strauss's business is carried on) is so far only an experiment with a view to the gauging of English taste. So far as they have gone, we understand the goods have been favourably received by dealers and shopkeepers here, and our manufacturers will have to look to their laurels or they will find that a fresh line of foreign competition has sprung up in their midst and on their own ground. The style of these goods bears evidence, it is true, of their German origin and conception, but, as we have said, these are only to be looked upon as a first instalment of what, when the demands of the English market are ascertained, is likely to be a formidable addition to our already numerous list of manufactured importations. The pieces we have selected for illustration, make up a very small part of the stock in Messrs. Bruckmann's new branch establishment, and which the black and white does very scant justice to; in fact, the great charm of of these goods lies in the beautiful blending of colours done in the precious metals. Varied and striking effects are obtained by casting, hammering, engine-turning, gilding in various shadings, and oxydising processes, while for artistic form, the resources of the designers of these pieces of plate seem to be inexhaustible.

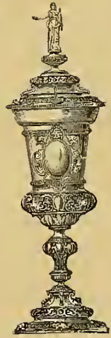


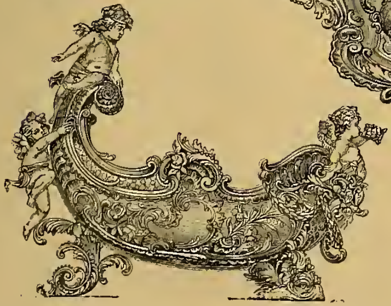


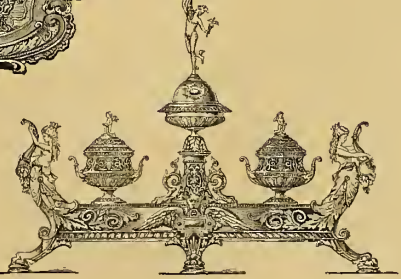












In addition to the goods shown in the cuts, all sorts of coffee, tea, and other sets, knife and fork sets, spoons and other articles in gold and silver plate are on view at the above-mentioned address, which persons interested in any way in this class of work would do well to visit.

Some beautiful knife sets we saw had handsomely carved agate and mother-o'-pearl handles, with gold or silver blades. Spoons and forks were made in various styles, including Renaissance, Persian, Regency, Pompadour, Louis XV. and XVI., Victoria, American, &c.

Presentation and racing trophies were made in a number of the aforesaid and special designs good effects being obtained by the various processes enumerated. Messrs. Bruckmann's head quarters is at Heilbronn, where they were established in 1775, and where they now employ over 600 men, and in addition they have branch establishments in Madrid, St. Petersburgh, Vienna, Paris, Brussels and Pforzheim, besides the one on the Viaduct. Messrs. Backes & Strauss are the sole agents for the English Colonies.

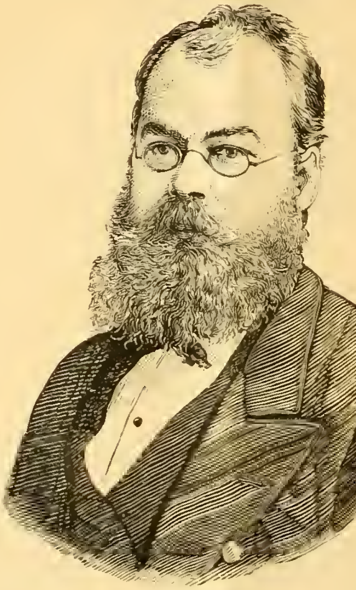
Half-hours with our Manufacturers.

II. Messrs. G. E. Walton & Co.

“We are quite willing to show anybody over our place,” said Mr. Pearce (G. E. Walton & Co.) to me, after we had been chatting a bit, and I had expressed my approval of his taste in the way of office cats. If I go over to America, the manufacturers have not the slightest objection to let me see through their works and everything in them. There is no doubt that the notion that such a system does not pay is erroneous. Personally, I don't believe in visitors, whether people in the trade or not, being received at little trapdoors like the holes through which you pay your money at the theatre. Nor do I sympathise with the ideas of those in our trade who are afraid to say anything to the representatives of technical journals for fear that business rivals may benefit at their expense. I believe that the danger of publicity is immensely exaggerated, and that the good coming from publicity is very considerably under-estimated by many worthy folk.”

“I am glad to hear so much from you,” I replied. “It is too late in the day to elaborate grandmotherly, coddling schemes of domestic protection, and in these times trade newspapers of a well-informed sort are a necessity.”

“There is no doubt, however,” continued Mr. Pearce, “that the days of trade conservatism, if one may use such a phrase, are surely, if slowly, passing away.”



F. A. WALTON.

Then we left the comfortable-looking cat to receive Mr. Pearce's visitors, went through some doors, and soon found ourselves in a kind of warehouse, from which, I was told, the different parts of the different articles for which G. E. Walton are famous are delivered to the workmen. What a miscellaneous assortment of pieces there was, to be sure. Here was a wooden tray full of stud tops, there a—

“This, right opposite the door,” interjected my guide, before I had time to make any detailed mental note, “is our fire and burglar-proof iron-room. In it the things are put away at night. How many drawers are there in it? Some hundred, each of which are divided into a dozen compartments.”

Next I was taken into a big room capable of seating 150 persons, where things were being put together. It was full of little trays, at which sat men, girls, and boys working away. Two things I especially noticed—first, the factory was well ventilated; second, it was clearly ‘Saint Monday.’

“How many of your people are keeping ‘Saint Monday?’” I demanded of my guide.

“Well, I should think about 25 per cent.”

“What is your feeling to the offenders?”

“Oh, it is the custom of the trade. They are fined, of course. The fines go to the sick fund. It is in a flourishing state, by the way. The profits are yearly divided among the men.”

“I wonder when journalists will be able to keep Saint Monday, let alone Saint Sunday. I suppose your folk are on piece work.”

“Every one of them.”

“What is your staff.”

“Four hundred in and out.”

“How about women or girls?”

“Probably a third are females.”

“Do you have many visitors who are not connected with the trade?”

“Yes, a good few. A week or so since I took through an Irish rector and his wife from the wilds of Connaught. You should have seen their wonder at the process by which those ladies' alberts were being put together.”

We then marched round the building. I do not think that it is necessary for me to tell my readers how alberts are made, so I keep the information that I gleaned for the enlightenment of the general public.

What did I notice going forward? I cannot remember all;—you know I really don't like to be always pencilling memoranda; the action reminds me of a hostile bailiff making an inventory; and it is not expedient, to say the least of it, for the demeanour of a journalist to conjure up ideas of such enemies of mankind.

Of course the men and women at Walton's are usually kept always at one thing. If they were not so restricted they would never obtain the facility which renders them able to turn out their work so quickly, and, as far as the firm is concerned, so cheaply.

I will not pretend to enumerate the various pieces of work I saw in progress. This article is not meant to be a dry tabulation of all that Walton's do at their factory. It is intended to be no more than a gossiping account of an hour's run through the works of one our leading manufacturers.

At one tray a man was fixing the silver tops on glass scent and mustard bottles. It is worth noting that the manufacture of this kind of bottles has almost disappeared from Birmingham, where once, and that lately, it was a by no means unimportant industry. Now, Walton's have to get their bottles from Germany. But though the Germans can make the bottles well, they can't for the life of them neatly fix on them the silver heads, and so, Walton's, for one firm, are good enough to do the work instead of them, and the world gets scent bottles and mustard-pots just as if the Germans were as downright clever as they are sometimes supposed to be.

Past men putting facets on links by means of lathes, past benches on which pencil cases, pencil holders, and pencil slides were engaging attention, we got to West's patents.

“After all there is nothing like West's,” interjected Mr. Pearce. West's solitaires have been an extraordinary success. For fourteen years we have been turning out 100 gross per week. While West's patent was in our hands—we use an improved West now—we paid him £1,000 a year, for which he had expended nothing. You ask if we do not come in for a good thing now and then. Of course we do, and that is the way we pay for it.”

“How do you come by your patents?”

“They are usually brought to us. If we are impressed by them we enter into an agreement, but we never go into a new thing unless we are certain to have a large demand.”

“How many patents have you now in hand?”

“I could'nt say right off. From twenty to thirty I should think.”

“What is this lying here?”

"That is a new thing—a serviette suspender. You see there is a hook and two tongs, like lips. One is fastened on the top of your waistcoat, the other grasps the serviette."

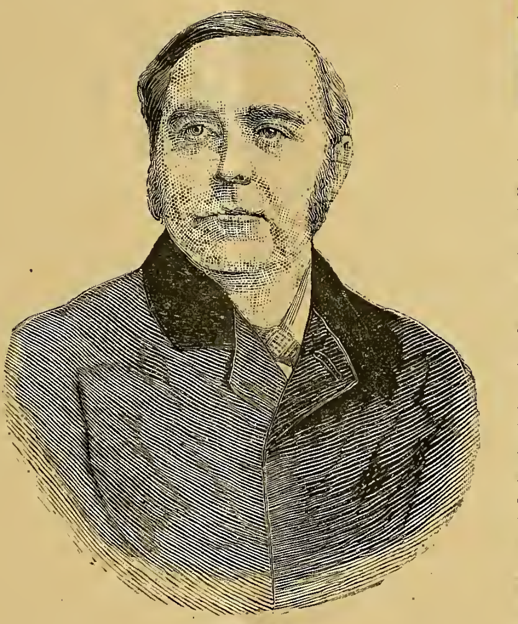
"We do a good trade, you will see," continued Mr. Pearce, "in devices for the Isle of Man, Cornwall, and Jersey, to be sold to trippers during the summer. Little things with the three legs or the Laxey Wheel for instance, we make a good many of for the Isle of Man. We have a part of this trade almost wholly in our hands."

I noticed that the patent washable imitation linen collars and cuffs have had studs specially made to suit them.

One could, of course, devote a whole article to, say "Walton's and the watch-key." Mr. Pearce says they have watch-keys from a farthing each or 3s. per gross, to, when made in silver or gold, any price you like. I noticed that Birch's novel advertising keys were being made in large quantities.

Silver brooches may be produced at similarly low rates.

"There is a neat brooch," said my guide, handing a specimen to me which was really a natty article about the size of a florin, and I shall be happy to sell you any quantity at 8s. the dozen.



W. PEARCE.

"Silver chains, such as sailors would buy, here you are, in all sorts of designs, from 2s. 3d. to 8s. Ladies' tasselled Alberts, also, at from 1s. 9d. to 12s."

A gas engine makes the lathes and other hand-machines go, and the weary leg-work at a treadle is thus obviated.

"How many patterns have you got in the place, Mr. Pearce?"

"Probably 2,000."

All the alloying, silvering and coppering is done on the premises. I was taken into airy shops in which engravers, seal mounters, and embossers were at work.

Collar studs one sees in the making in all sorts of qualities and patterns. There was one nice collar stud, the shank of which swung about in its bone back and admitted of a comfortable fastening of the collar. The price was 3s. 6d. the gross.

The shopkeeper notwithstanding the fact that he rejoices in being able to buy silver brooches and chains, and studs at such low prices is often troubled by the manner in which these goods, especially studs and solitaires, are mounted. They are sewn on a card with one long string. The poor man has the luck to sell one and all the rest get loose and betray a desire to take their liberty and roll about his shop window. Mr. Pearce showed me a patented plan adopted by his firm to remedy the annoyance in question. A metal holder which can be fixed on the card, and provides clasps for holding the studs, links, solitaires, pencil cases or not has been devised. It is a noteworthy fact that since the adoption of this improved manner of fastening goods, the trade in the articles so sent out has doubled. *Verb. sap.*

I was shown a new patent one-piece unbreakable stud upon which there is being a run. It is worked up from a single disc of metal, and to its unbreakable qualities adds the advantage that by using it, linen stud holes are not worn out.

Forty or fifty of Walton's customers have their goods sent to them mounted on cards bearing their monogram, and of these monogram cards there are necessarily a great number at the manufacturer's. Mr. Pearce believes thoroughly in goods being nicely mounted. The firm's stationery bill is enormous. Cards are ordered, 150,000 at a time.

Walton's seem to be doing a good deal at present in pretty metal photograph, clock, and little mirror frames Their speciality in the way of mounting imported Italian mosaic work of a most skilful kind on these frames has been productive of some attractive articles. During the Italian Exhibition, and since, their business in this direction has been considerable. They are, I was informed, the only people in England who go in for this combined mosaic-metallic work. Walton's have also created a large demand for mosaic work in connection with finger and scarf rings.

Altogether, I was much interested with what I saw and what I heard within the walls of the largest fancy manufacturing house in the world.

J. W. R.-S.

Watch & Clock Makers' Benevolent Institution.

THE Seventy-fourth Annual Meeting of this Society was held last month under the presidency of the Treasurer, Mr. Bracebridge. The statement read by the Secretary was largely an appeal for more active support and the familiar bewailment of the results recent years of depressed trade have had on the funds of the Institution.

While the committee would gladly have increased the number of pensioners, the contraction of the funds at disposal had not only precluded them from extending the benefit to others, but had barely enabled them to meet the requirements of existing annuitants. The committee, however, had not been content to view the prevailing distress without an effort to enlarge the field of practical sympathy. Earl Compton, M.P., ever alive to the welfare of Clerkenwell workers, had, notwithstanding his many engagements, shown his interest in the Institution by undertaking the office of President. The Society had for now three-quarters-of-a-century uninterruptedly aided aged and infirm workmen and their widows, and it was a satisfaction to state that the cost of administration had averaged less than 3 per cent. of the income. The number of pensioners who have partaken of its benefits was 304, viz., 213 men and 91 widows. The amount paid to them in pensions had been £18,089. There were at present 13 pensioners, viz., 9 men and 4 widows, two being elected at the last election, viz., Mr. Swift, by 38 votes, and Mrs. Ward, by 36 votes. The pensions are £12 12s. per annum to men, and £8 8s. per annum to widows. The financial statement showed that the invested capital was £3,021.

The Chairman having briefly moved the adoption of the report, Mr. Jackson in seconding it, said it seemed to him that the Society was entering on a new era, for they had a nobleman as President who took an active interest in the working people of the district. He was quite sure Earl Compton, if it were necessary, would come among them and take the chair in any movement that might be taken for the welfare of the Institution.

The resolution being put and carried, the proceedings closed with a vote of thanks to the Chairman.

Watch Screws.

ALTHOUGH screws have such an important function in the construction of a watch—as, from their economy of space they are employed in preference to other methods of fastening, in the holding together of its various fixed parts—it is not every watchmaker who knows very much about their correct theoretical form and properties, their production in quantities, or even of the correct names of their different proportions. This knowledge which necessarily forms part of the education of engineers and others who are engaged in the larger mechanical industries, has never been much insisted on in the education of watchmakers, and it is doubtful if, even now, it is an accepted part of the curriculum in any of our modern horological schools. The minuteness of watch screws has doubtless been the cause for the prevalent want of attention that is paid to their correct theoretical form, and yet this very minuteness is obviously one of the strongest reasons why their form, especially in the shape of the threads, should receive particular consideration.

Even engineers, however, have not always had the advantage of a tabulated system of threads, as it was not until after Sir Joseph Whitworth, in 1841, communicated to the Institution of Civil Engineers a paper on "An Uniform System of Screw Threads," that they possessed one.

In 1878 and 1880, Monsieur Thury, of Geneva, and, later, Sir Joseph Whitworth gave to horology a uniform system for watch screws, the former adapting the millimetre and the latter the inch as the unit of measurement. In 1881, the British Association appointed a committee to determine "a gauge for the manufacture of the various small screws used in telegraphic apparatus, in clockwork, and for other analogous purposes," and they finally recommended the adoption of the Thury system, subject to a slight modification in the form of the thread, which consisted in rounding it a little at the top and bottom. The series commences with a screw $\frac{1}{100}$ inch in diameter, and rises to about $\frac{1}{4}$-inch, which would include all screws likely to be used in watches and clocks. The numbers used to designate the screws range from 25 to 0, and with the aid of a simple mathematical formula, all the main dimensions of any given screw can be easily determined.

It will thus be seen that a perfect system of obtaining uniformity in the construction and dimensions of screws has for some time been formulated for watchmakers, had they chosen to avail themselves of it. But it is not only in the shape of watch screws that they have been neglected. Every practical watchmaker has experienced the troubles and annoyances occasioned by their want of uniformity in different makes of watches, in the difficulty of replacing lost or broken screws; so that although a gross or more of mixed screws can be bought for a few pence, it is often quicker and cheaper in the saving of time to make a new screw in the place of the one that has been lost than to search for a suitable one through such a varied assortment.

Fully alive to the aforesaid inconveniences, Mr. Corniolet (Messrs. Picard Frères) some years back instituted a small factory for the production of perfectly uniform and interchangeable screws, for the amelioration of the working watchmaker and repairer. He has christened his system the "Progress:" and the excellence of the screws produced, and great saving of time to those who have used them, have gradually forced the "Progress" screws to the front; the increased demand having built up from an unpretentious beginning quite a new and important industry for Clerkenwell. In fact, the "Progress" system of screws, taps and gauges, promises from all appearances to soon become the recognised standard for watchwork. Based on Thury's and the British Association's reports, these screws are manufactured and all the dimensions gauged on the metric system, and from what we saw when recently visiting the factory in Turk's Head Yard, Turnmill Street, the processes leave little to be desired. A most careful system of examining and assorting the screws guarantees practical accuracy; so that when a watchmaker gives an order for any number of required sizes, he may rest pretty well assured that he will get those sizes and no others.

Heads, pitches, diameters and length are all gauged and assorted, and after the screws are finished, hardened and tempered, polished and blued: they are packed in neat little boxes, each of which is placed in a nest containing from one dozen to four dozen boxes. A complete assortment of screws is kept for every known make of Swiss watch. Bar screws are numbered from 8 to 12: pillar screws from 9 to 12; cocks from 10 to 12, and so on.

The polishing laps and other various appliances are driven by steam power, and a capital light makes a pleasant workshop, whose other attributes (too little considered very often in similar establishments) make the lot of the employees an easier one than usual, and insure a maximum of efficiency. Mr. Corniolet contemplates (if indeed he has not already carried out his intention) organising a similar system for English movements.

Sir John Bennett (Limited).

THE statutory meeting of this company has just been held, and the shareholders were regaled with very sanguine expectations of what they may expect by and bye.

The chairman, Mr. James Inch, stated that "the reports of the business they are doing in Cheapside are satisfactory." They had "been able to keep the thing going fairly well." Considering the state of trade they had, "under the circumstances, done very well." Shareholders would see by the progress of the company that "they were, taking steps to secure the desirable result of increased business, and he trusted that their efforts would be satisfactory." These very guarded prognostications acted as a damper upon the meeting, and nothing that was said afterwards tended to lighten the gloom.

A shareholder asked the pertinent question whether the directors intended to pay the dividend on the eight per cent. shares—it will be remembered that of the capital of £90,000, £60,000 is made up of 12,000 "A" shares of £5 each, entitled to an eight per cent preferential dividend—half-yearly, but the chairman did not see his way to promise that. "Of course," said Mr. Inch, "if they found themselves at the end of six months in a position to pay the accrued interest he should be the very first to propose that it should be immediately paid," but, though pressed, he would not go beyond that.

The most reassuring remarks made by Sir John Bennett were that they had been "passing through bad times," and all he could say was that "during the past fourteen weeks the results had been quite equal to what they were in the first fourteen weeks of last year."

Art-Workmanship Prizes.

THE Society of Arts offer the sum of £150 in money prizes, as well as twenty of the Society's Bronze Medals, for objects in the Arts and Crafts Exhibition, to be held in the autumn of the present year. The judges will be empowered to distribute the money, or such proportion of it as they see fit, in any sums they think will best meet the relative merits of the exhibits, at the same time paying due regard to the cost of production. The whole sum will only be expended in case of works of sufficient merit being forthcoming.

It will be understood that the Arts and Crafts Exhibition Society do not undertake responsibility in respect of the awards of the prizes, which will be a matter solely under the control of the Society of Arts.

The following rules under which the prizes will be offered are substantially the same as those under which the previous art-workmanship competitions of the Society have been carried out.

The prizes will be awarded to craftsmen, not professional artists, and the work must have been executed in the United Kingdom or its dependencies.

The objects submitted for competition may be the work of one workman, or of several workmen working in combination. They need not necessarily be the property of the workman or men sending them in. Manufacturers or employers may exhibit articles on behalf of their workmen. In this case, besides the name of the manufacturer, the names must be given of all the workmen who have executed portions of the work, with a statement of the portion executed by each. If any prizes are awarded they will given to the workmen.

In awarding the prizes, the judges will take into account the following points :—

1. Originality or beauty of design.
2. Fitness of treatment.
3. Excellence of workmanship.

The works will remain the property of the competitor or of the person from whom he has borrowed them for the competition.

All the prizes are open to male and female competitors on equal terms.

The Exhibition of the Arts and Crafts Exhibition Society will open at the New Gallery, Regent Street, on Monday, October 7th, and will close on December 7th.

The following is a classification of the objects to be received for exhibition, as put forth by the Arts and Crafts Society :—

(*a*) Designs and cartoons for decoration of all kinds.
(*b*) Decorative painting—more particularly in association with architecture or cabinet work.
(*c*) Textiles—Tapestry, Needlework, woven and printed Fabrics, Lace.
(*d*) Painted glass.
(*e*) Pottery—Tiles, Majolica, painted China.
(*f*) Table glass.
(*g*) Metal work—Wrought iron, brass and copper Repoussé, Gold and Silversmith's work and Chasing.
(*h*) Wood-carving } Carving in ivory and other materials.
(*i*) Stone-carving }
(*j*) Cabinet work—inlaid, and painted and carved furniture.
(*k*) Decorative Sculpture and Modelled Work—Friezes, architectural enrichments, relievos, plaster and gesso work, &c.
(*l*) Printing —Book decoration, Printers' ornaments, illuminations and decorative MSS. Wood and metal engraving.
(*m*) Book-binding and cloth cases.
(*n*) Wall papers.
(*o*) Stencilling.
(*p*) Leather work—Stamped, tooled, cuirbouilli, &c.,

And such other kinds of decorative Art not above enumerated as may be approved by the Selection Committee.

Information respecting the Exhibition and forms of application may be obtained from Mr. Ernest Radford, Secretary of the Arts and Crafts Exhibition Society, at the office, 44, Great Marlborough Street, London, W. The Secretary is Mr. H. Trueman Wood.

The Imperial Diamond.—Found some years ago in South Africa and purchased by a syndicate of capitalists in London, this famous stone is now on view at the Paris Exhibition. The value of this gem makes it a great attraction, as was the case with the Koh-i-noor, or "Mountain of Light," when it was first shown to the European public at the Exhibition of 1851. But the Imperial has none of the historical interest attaching to it which the gem of Golconda possesses—the gem which was worn 5000 years ago by Karna, one of the heroes celebrated in the *Mahabharata*, which the Great Mogul wore, which the Persian invader, Nadir Shah, named, and which, on the conquest of the Punjab in 1849, became the property of Queen Victoria. Since it was re-cut, the weight of the Koh-i-noor has been reduced from $186\frac{1}{16}$ carats to $106\frac{1}{16}$.

Sale of Plate and Jewellery.

MESSRS. FOLEY, SON & MUNDAY, of Trowbridge, sold by auction last month, at the Assembly Rooms, Bath, the valuable silver plate, jewellery, and library of books, late the property of Mr. H. G. G. Ludlow, J.P., deceased, of Heywood House, Westbury. The sale attracted a large company, and as can be seen from the figures given below, the prices realised were exceptionally good. The auctioneer in opening the sale, stated that a finer collection of plate bad probably not been submitted to competition in the county for many years past, and that every lot would be sold without the slightest reserve. The following are some of the principal prices :—Plated articles—set of dish covers, 14½ guineas ; venison dish and cover, 7½ guineas ; pair of soup tureens, 15 guineas ; two pairs of entrée dishes, £18 ; pair of wine coolers, £6 ; centre piece, 22 guineas. Amongst tbe silver articles, the 12 oval tea-trays and meat dishes realised together £232 7s. 6d., ranging from 9s. 3d. to 5s. 9d. per ounce ; oval cake basket, £10 10s. ; wire ditto, £13 4s. ; two goblets, £8 15s. 10d. ; antique epergne, with four corner ditto, sold at 17s. 9d. per ounce, and realised £83 4s. ; tea urn, 35 guineas ; ditto at 17s. 4d. per ounce, £24 17s. 3d. ; cruet stand at 7s. 6d. per ounce, £33 15s. ; the candlesticks, 12 in number, sold as follows :—Four at 15s. 3d. per ounce, £20 8s. 6d. ; four at 20s. 9d. per ounce, £41 10s. ; and four with plated candelabra, £25 10s. ; a very chaste claret jug at 19s. 9d. per ounce, £29 7s. 9d, ; antique urn, £19 19s. ; plain circular punch bowl, 11 inches in diameter, 49ozs. 15dwt., sold at 30s. 6d. per ounce, £75 17s. 4d. ; pair of fluted claret ewers, at 21s. per ounce, £76 13s. ; fluted tea service, 18s. per ounce, £48 ; small cream bucket, 35s. per ounce ; 16 salt cellars, 17s. 6d. and 16s. 6d. per ounce, £41 2s. 4d ; cruet stand, 17s. 6d. per ounce, £17. The whole of the other plate realised equally good prices. The jewellery sold as follows :—Miniature set with 86 small brilliants, 67 guineas ; pair of gold bracelets with diamond clasps, 58 guineas ; spray of diamonds, 160 guineas ; cluster brooch, £47 ; pair of diamond earrings, £51 ; the rings, £31, £16 10s., £12 10s. ; &c. At the conclusion of the sale the auctioneers were highly complimented, the London dealers remarking that it was one of the highest priced sales they had attended for some time, and it was their opinion that if sold in London, the plate, &c., would not have realised nearly so much.

The Royal Plate.—The royal plate of Great Britain which is used at the State banquets is probably the finest in the world. It is usually kept in two strong rooms in Windsor Castle, and is valued at £2,000,000. The gold service, which was purchased by George IV., dines 130 persons, and the silver wine-cooler, which he bought about the same time, holds two men, who could sit in it comfortably ; the splendid chasing on this piece is said to have occupied two years. There are some quaint old pieces in the Royal collection which belonged to Queen Elizabeth, having been taken from the Spanish Armada, and others were brought from India, Burmah, and China, and there is one cup which belonged to Charles XII. of Sweden. The vases, cups, candelabra, and fancy pieces are usually displayed on the huge sideboards at each end of the table of St. George's Hall when a state banquet takes place. There is a peacock of precious stones valued at £40,000. The body and tail are composed of solid gold, profusely studded with pearls, diamonds, rubies, and emeralds. The tiger's head, known as Tippoo's footstool, is formed of silver gilt, with eyes of rock crystal and a tongue of solid gold. These two trophies of Oriental extravagance were taken at Seringapatam, and presented subsequently to George III. There are an immense number of gold shields, some of which are richly ornamented. One of these was formed of snuff-boxes under the direction of George IV., and is valued at £10,000. There are thirty dozen of plates, which were bought by that sovereign at a cost of £11,000.

The Neuchâtel Chronometer Trials, 1888.

In his report of these trials, Dr. A. Hirsch, Director of the Observatory of Neuchâtel, regrets to have to state that the proportion of Philips's theoretical curves, although their theoretical superiority has been confirmed by the experience of a long series of years, is still becoming less, these springs only figuring in the chronometers of 1888 in the proportion of 56 per cent. At the same time the result of this year is still in favour of Philips's springs, of which the mean variation is 0s·47 as against 0s·55, representing the variation of the chronometers provided with other kinds of springs. The best result recorded for 1888, as well as for the period of eighteen years, by chronometers with Philips's cylindrical spring is by one having two terminal curves. Then follows this time in the order of regularity of timekeeping, the spherical spring which, for the mean of eighteen years, is passed by Philips's springs, flat with two curves and cylindrical. The least favourable result this time still appertains to the Breguet spring and to the ordinary cylindrical spring. Dr. Hirsch says he can only repeat that the use of springs with theoretical curves facilitates the timing processes in so evident a manner that one would expect to see them employed, if not exclusively, at least in preference to others, notwithstanding the increase of work which they necessitate.

During the last period there were sent to the Observatory 23 chronometers with palladium springs, of which the result as to daily variation is this time very much the same as that of the general mean, being 0s·49 instead of 0s·50.

It is necessary, however, to remark, that if abstraction is made of four marine chronometers having this spring, the mean variation of three other classes is 0s·57, so that it is not yet possible to pronounce a definite judgment upon the influence (favourable or prejudicial) of this kind of spring upon the performance of chronometers.

Without wishing to deny that the use of palladium for the springs of chronometers should diminish the magnetic influence upon the performance of these latter, it is nevertheless necessary to recognise that the danger of this influence is considerably exaggerated, because it may be affirmed that this trouble only presents real gravity where a chronometer is brought near to a powerful dynamo electric machine, while the action of simple masses of iron or steel remain without appreciable influence upon the performance of chronometers, provided their principal steel parts have not been magnetised beforehand by the proximity of a similar machine.

It is interesting to note in this respect that the chronometers which the Non-Magnetic Society, of Geneva, have sent to the Observatory in 1888, to the number of seven, are far from having given a regularity of performance superior to the other chronometers, because the five pieces from this source which have undergone the complete trial during six weeks, have shown a mean daily variation of 0s·59, while the 37 other ordinary chronometers are only charged with a variation of 0s·48, and the two chronometers of the Non-Magnetic Society, which have passed a trial of fifteen days only, have had a variation of 0s·79, so that the mean daily variation of these seven non-magnetic watches is raised to 0s·65, that is to say, considerably higher than the general mean.

The Burmah Ruby Mines.

A RANGOON correspondent contributes the following interesting article to a contemporary:—I am writing from under the shadow of the ancient Shway Dagon Pagoda, gilt from base to summit by the Burmese faithful, and topped by a heavily gilt Thee or Conical Cap, studded with precious stones and weighing some tons. Thus covered with gold, at the cost of many lacs of rupees, and more than 300 feet in height, its yellow sides glisten in the sun. It commands a view over a beautiful country. I look down upon a large and picturesque lake, studded with small wooded islands, around which the light skiffs of the Rangoon Rowing Club are gliding—upon an undulating country well wooded and fertile, from which the roofs of the houses of those resident in the outskirts of Rangoon peep out upon a town fast increasing to 200,000 inhabitants—and then on to a broad river, a branch of the Irrawaddy, crowded with shipping, as it winds its swift way like a silver ribbon, until it is lost in the sea some 26 miles off. The graves of Doran, Loch, Granville and Gordon, of the Royal Irish, with some others, lie close beside me. These were buried where they fell, storming the pagoda. Half a mile off, in the spur of the hill, the white tombstones of the cantonment cemetery are visible amidst the dark evergreen foliage. No better idea of the mutability of Eastern European society can be conveyed than by the experience of the writer. It is just eleven years since he left Rangoon and last stood on this spot. In the interim the officials, the leading merchants, officers and their regiments, lawyers, judges and parsons have all disappeared, and out of a very large society, about six men and one lady represent the remnant of over 250 which were met before he left. The numbers now are quadrupled. Houses have sprung up where jungle held the sway, but the old faces have gone, and the whole of the society has changed. The recent mounds in the cemetery account for many, while the open graves from here apparent, always gaping ready for emergencies, suggest creepy thoughts to those left. I passed Dr. Romains, the Government analyst, riding to explore for cholera germs in a pond, the green water of which is now visible. In 48 hours after he was dead and buried. I had proposed proceeding to the ruby mines, but other and more pressing business took me to Bassein. This is a town taken by Godwin and 800 men in 1854. The journey takes about two days and a half, and is performed in one of the Irrawaddy Flotilla Company's steamers. This is one of the best-managed steam companies existing. It did such good service during the war that it received the thanks of the Government, and the managers, Messrs. Swann and Kennedy, were decorated. It is now under the very able management of Mr. Miller. It has arisen from two petty steamers in 1864 to 60 steamers and 92 flats now. Its shares cannot be obtained, and the profits are wisely kept from public ken here, though it is said that this year they will be reduced 50 per cent. The railway must soon prove a formidable opponent. The boats travel by night as well as by day, a powerful electric light high up in the bows enables them to proceed. As we glided through channels just wide enough for the boat to steer, the lights glanced on the dense foliage of a tropical forest. In many places it almost closed over our heads. The fire-flies literally covered the trees, giving them one continual phosphorescent glow. Now and then we disturbed an alligator from his repose on the bank. Two days of such winding brought us to the Bassein River. It is near the mouth of this that, about twelve years since, a lighthouse 120 feet high and 60 feet broad disappeared. Built on iron piles firmly screwed into the sand, it had stood many a violent storm. But one night no light was visible; a British India steamer trusting to the light ran ashore, and when daylight came 30 fathoms rolled over the site. A Government steamer dredged for many days, but not the slightest vestige of the lighthouse or its keepers was ever found.

Captain Jacks, the commander of our steamer, pointed out to us the spot where Mr. St. Barbe landed to chase some dacoits. He was the victim of a wonderful presentiment. He was known as the tallest and handsomest man in Burmah. On his return to Rangoon on leave, he informed his friends that he had been to some fortune-teller in London, who had told him he would be shot in a foreign land. He said he was quite certain such would be his fate. Rashly brave, he soon after went out to arrest ——, a noted dacoit, and his gang. On coming up with him, he called out for him to surrender. Twice was he shot at, but he never returned the fire, and still advancing, the third shot went through his heart. He seemed as if prepared for his end. By the kindness of the agents of the ruby mines, Messrs. George Gillespie and Company, I was enabled to interview the mining engineer, Mr. Lockhart, and the finance manager, Mr. Attlay, who had just arrived from the mines.

It is singular that while London seems to have been in a furore about them, here in Rangoon they are hardly ever mentioned. They are situate about 80 miles from Mandalay. The train leaves for Mandalay about 5.30 p.m., and travelling at a very slow rate arrives at about 8 p.m. the following day. Thence an Irrawaddy steamer runs to Thabeit Kin, and the remainder of the distance is performed on ponies. There is a good road nearly up to the mines, a distance of 20 or 30 miles. It passes through picturesque valleys and over hills covered with jungle, and in part finely wooded with teak and other trees. Leopards, bears, tigers, elephants, deer and jungle fowl are found. Mr. Lockhart heard of three men being taken away by tigers during the last month. There are some villages on the route inhabited by Burmese and Shans. The rubies are found in limestone rock, and the mines are said to have been worked for 250 years. They are dug out from shallow holes. Often a family works one. In some instances water is turned on through bamboo viaducts into the sides of the hills, but generally the earth is taken up and placed on a washing floor, over which water is passed, and the *débris* is afterwards examined. Amongst it is found the rough red stone of the ruby, the light pink of the rubelæ sapphires, spinelles, the zircon moonstone, garnet, cornelian and cinnamon stone. The new company does not actually come into possession until the 1st of November, when their rent begins. The natives, who worked mostly for wages, hold their licenses until the 31st of October, and provision has been made to preserve their rights after that date. Mr. Lockhart appears very sanguine of the success of the mines, but no one can know much about ruby mining, as Burmah is the only place, I believe, where rubies are found. Until lately no European was ever allowed to visit them. The Burmese Government made about two lacs a year, but how much was stolen is a problem no one can solve. The ruby mines may turn out profitable, but as to whether they can ever realise the profits hoped for the future can only solve. It is as speculative an enterprise as gold mining. The British Government gets one-sixth of the profits. The climate appears to be healthy in the hills, but new comers are liable to attacks of fever. The people are of a handsome type. Rosy cheeks and black hair predominate amongst the women. No punkahs and no ice are requisite. It freezes in the cold weather, and report says that English navvies might work there. But I doubt it. The country is most beautiful and picturesque, and in some parts thickly populated. Moqok, the nearest town, has about 2,000 inhabitants, and is strongly stockaded, like all the other towns. Moqok has been largely attacked by marauders, but Mr. Lockhart and Mr. Attlay both informed me that they were never molested. Some fine houses are being erected, and the mines are guarded by 300 military police. It is difficult to convey an idea of the habits of a country so entirely different to England. To properly comprehend it we must go back to the time depicted in Scott's novels, when every man went armed and every town was fortified, while Dugold Dalgetties roamed about with their bands of marauders. These Dugold Dalgetties are now Dacoit leaders. It is absurd to suppose that the annexation has anything to do with the disturbance. We do not crucify and disembowel our Dacoits when caught and let them rot on crosses to deter others as the Burmese did. And probably having been used to that kind of punishment they rather despise our milder *régime*. But as to patriotism being any motive power amongst these Dacoits, it is ridiculous. The history of Burmah for many years gives the lie to this idea. They and their fathers have lived by plunder, and they are suddenly introduced from a civilisation of 300 years ago or more to the refined civilised code of 1889.

Cromwellian.—An American farmer put up in his garden a sign on which was written: "Boys, don't touch these melons for they are green and God sees you." An exchange says that some of the merchants of the United States might with advantage parody this and hang up in their stores the motto: "Honesty is not only the best policy, but it pays." Recent events in the trade here point a moral to the above.

Defective Sight and its Optical Correction.*

By W. D. Mason, A.P.G.

PRACTICAL REMARKS.

THERE is no ordinary subject affecting their welfare to the same degree which most people know so little of as defective sight and how it is remedied by optical appliances; and there is no branch of any trade or profession more liable to be made a mystery of by quacks than the adaptation of spectacles to correct the various defects of vision. Knowledge and experience and a considerable amount of skill and intelligence are required in dealing with impaired and defective sight, but there is no mystery about it whatever. There are certain well defined principles to be recognised and these should never be lost sight of.

First as to the structure of the eye, without going into too many details; the eye may be regarded as a globular body containing mainly the aqueous and vitreous humours, or water and jelly. The front part of the eye, which is called the cornea, projects more and is of a more convex curvature than the rest.

The pupil, which has the appearance of a circular black spot, is in reality an opening in the iris, a coloured screen which may be blue, brown, black or grey, and which excludes all light from the eye except that portion which finds its way through the pupils. The pupil contracts or expands according to the greater or less amount of light available. When the light is strong the aperture is almost closed, and when the light is dim the aperture becomes larger so as to admit as much light as possible. But for this arrangement either ordinary daylight would be overpowering or we could not see at all in the twilight. The iris is between the cornea and the retina, or sensitive membrane, at the back of the eye, like a screen to shut out the light, and the pupil is a hole in the centre of the screen. The pupil appears black because there is very little light inside and a great deal outside, just as the key-hole of a door will appear quite black from a well-lighted hall if the room within has no other light than what finds its way through that opening. Immediately behind the pupil is suspended the crystalline lens which greatly assists in converging the rays of light so as to bring them to a focus upon the retina. This lens is bi-convex, that is, thickest in the middle and thinnest at the edges, and the curvature of both sides tends to bring this about, but it is more convex, or curves outward, more sharply at the back than in front.

If you have ever stood behind a photographer while focussing an object, you will have noticed that the image on the screen is inverted or wrong side up, and it is certain that all images focussed on the retina are also inverted. There are many theories to account for erect vision with an inverted image, but none of them conclusive. The shortest way out of the difficulty, and by no means a new one, is the statement that we do not actually *see* the inverted retinal image, but only see *by means of it*. The sensation of sight is conveyed from the retina to the brain by the optic nerve. This is a rough and imperfect description of the structure of the eye, but tolerably correct so far as it goes, and quite sufficient to account for the different peculiarities of vision.

We will next turn our attention to refraction, or the action of the transparent media of the eye upon light. By the refraction of light is meant the change of direction which the rays of light undergo in passing from one medium to another. When we speak of the refraction of a person's eye we refer to the total amount of power which the eye in a state of rest, and by virtue of its shape and construction, passively exerts in bringing parallel rays to a focus.

Light proceeds from luminous bodies and is reflected from all other visible objects in straight lines in every direction. The rays of the limited amount of light which enter the pupil of the eye from a very near object have considerable room for divergence, but from a far distant object the rays which pass through the pupil must obviously be very nearly parallel. For all practical purposes rays of light proceeding from a distance of twenty feet may be considered parallel, and are called so in all works relating to the subject. Now the action of a convex lens upon parallel rays is to cause them to converge till they meet at a certain point called the focus of the lens. This point will be at a distance from the lens varying according to its strength, or the greater or less degree of its curvature. Thus a 12-in. lens is one that will cause parallel rays to meet at a point twelve inches from itself. A 4-in. lens would bring them to a focus at four inches, and so on. The stronger the lens the shorter its focus.

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The action of the normal passive eye, exerting no accommodation or power of adjustment, is to bring parallel rays to a focus exactly on the retina, so that the small inverted image previously mentioned is sharp and well defined. But to obtain an equally clear image of near objects which reflect divergent rays, certain muscles are brought into play which alter the curve of the crystalline lens, causing it to become more convex and to act more powerfully to neutralise the divergence. Therefore a normal or perfect eye is quite passive and at rest when viewing distant objects, but an effort must be made to distinguish those near at hand, and the nearer the object the greater the effort required. The ordinary range of a good, healthy eye is from infinite distance to a near point about five inches away. The reason why such an eye loses sight of very distant objects is because they are not large enough to form any appreciable image on the retina, but the most distant stars visible to the naked eye, should appear quite clear and distinct though apparently small.

This function of accommodation we exercise quite involuntarily and unconsciously: but that we do exercise it is easily proved by holding up a finger about a foot before the face, and then looking across the street. So long as the attention is concentrated on the houses on the opposite side of the way they are seen perfectly, but the finger very imperfectly; but when the finger is intently regarded it becomes clearly defined, while the distant houses in turn become dim and shadowy. From this simple experiment we learn that the eyes cannot possibly be accommodated for two different distances at the same time; and if they are directed first to the houses and then to the finger repeatedly and in rapid succession, we become quite conscious of the muscular effort involved. It should be mentioned here that, optically speaking, it is a matter of perfect indifference whether the change is made by the more powerful action of the elastic lens within the eye or by the addition of an artificial lens without.

With a 12-inch lens the normal eye would see a small object twelve inches distant, and with a 4-inch lens one four inches distant, without any effort of accommodation whatever. The eye would be perfectly passive and at rest: but to see a greater distance at all clearly, the lens must be removed. But it may be objected that convex lenses, or old people's glasses, *draw*, and cause dimness, giddiness, and pain in the eyes of young people with good sight, and do not afford any sensation of rest or relief, but quite the contrary. It is true that such lenses produce dimness of vision, in fact, artificial myopia, or short sight, when used for distance; but when used for near work, at or just within their focal length, they will not have that effect. As to the pain and drawing of the eyes, it would not be noticed at all, if a single lens were used for one eye and the other covered or disregarded. And it must be remembered that the foregoing remarks apply to the normal *eye* considered as a single optical instrument, and not to a *pair* of such eyes.

To explain the distressing symptoms produced by wearing glasses when not required, or of too strong a focus, we must attempt some explanation of convergence and binocular vision. Though we see with both eyes and a distinct image is formed on the retina of each, yet so long as these images are formed on exactly corresponding parts of each retina the brain receives the impression of seeing one object only. Thus, when we look far away into the distance the eyes are both turned in the same direction, and straight lines drawn from corresponding points at the back of each eye to the object seen would be parallel. But when the eyes are directed to some near object they are turned towards each other and straight lines similarly drawn from the back of each eye would meet, the object viewed lying at the point of intersection. Each eye sees its own distinct image—not the small inverted image on the retina, but an enlarged erect image projected forward into space; but when the eyes are properly directed towards the object the two images coincide, occupy the same space, overlap each other, and appear as one.

To prove that each eye sees its own separate image and that objects nearer and further away than the one looked at appear double: hold up a finger about a foot before the face as in the former experiment, and then another finger of the other hand as far off as you can reach. Look intently at the far finger. The near one will appear double and transparent. Now look at the near finger and immediately the far one becomes double and indistinct. By closing one eye at a time, you can easily tell which image belongs to the right eye, and which to the left, and you will find that when you are looking nearer than the object, the right and left images belong to the right and left eyes respectively; but when you are looking further off than the object, the images are crossed, and the right image belongs to the left eye, and the left image to the right eye. This turning of the two eyes to a point between them is called convergence, and enough has been said to show that there is no effort of convergence in viewing distant objects, but that one effort must be made to turn the eyes inwards to maintain single vision in looking at near objects, and that the nearer the object the greater is the effort of *convergence* as well as *accommodation* required.

There is an intimate relation between the functions of accommodation and convergence in most eyes. Supposing a person of normal refraction regards an object twelve inches off, he will be accommodating for twelve inches, and also converging for the same distance. But with a pair of convex lenses of twelve inches focus, his accommodation would be at rest while his convergence was brought into play, and pain and "drawing" of the eyes would soon be felt. With concave glasses of the same strength, looking at some distant object, the accommodation of such a person must be used to overcome the lenses, while no convergence is required. He is, in fact, accommodating for twelve inches without converging at all. This would be equally irksome and tiring to the eyes. So that, as a rule, when neither accommodation nor convergence is required, vision will be easy, and when both are used together there will be no difficulty; but to use the one without the other immediately causes a strain.

We have now considered the three main factors concerned in perfect vision—refraction, or the power of the passive eye to bring parallel rays of light to a focus; accommodation, or the ability, by altering the curvature of the crystalline lens, to increase the refractive power of the eye and enable it to overcome the divergence of the rays reflected from near objects; and convergence, or the turning of the two eyes inwards to direct them to the same point between them and preserve single vision when using both.

Defects of vision are of two kinds, structural and functional. The former defects are attributed to a faulty shape of the eyeball; the latter to a stiffening of the crystalline lens or weakness of the muscles of accommodation or convergence.

Eyes are divided into four classes, according to their construction. First, there is the emmetropic eye, which is theoretically perfect. Emmetropia means correct measure. Such an eye brings parallel rays to a focus exactly on the retina, without any effort of accommodation, and must exercise more or less accommodation for near objects, according to their distance. The other kinds of eyes are the myopic, hypermetropic, and astigmatic. These are sometimes grouped together as ametropic eyes, or eyes which are out of measure, because they do not bring parallel rays to a focus on the retina. For divergent rays reflected from near objects, such eyes have to exercise either more or less accommodation than emmetropic eyes, and sometimes none at all.

(To be continued.)

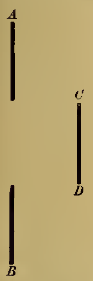
Mechanical Ocular Defects.

FOLLOWING the article on Lenses which we published last month, Dr. Bucklin, in the *Jewelers' Circular*, goes into

The Qualitative and Quantitative Analysis of Lenses.

The quickest method of determining the nature of any lens we wish to examine is to observe the effect produced on distant objects observed through it, when the lens is held just within its focal distance from the eye and it is moved in various directions.

Prisms.—A prism when rotated causes any distant line which crosses its base at right angles to break, and the portion of the line seen through the prism becomes displayed to one side, but always remains in a position parallel to those portions of the line which are observed outside of the margins of the prism; thus if a vertical line be observed which passes squarely through the base of a prism when it is rotated, the relative positions of that part of the line which is seen through the prism and that part of the line which is seen above and below the prism will be thus—



A B represents that part of line seen above and below the prism. *C D* represents that part of the line seen through the prism. If the prism be *simple* its strength may be determined by an adjustable triangle which registers in degrees the angle at which it set. The strength may also be determined by placing a prism with the base in exactly the opposite direction of sufficient strength to entirely neutralise all tendency to displacement when the prisms are rotated; in this case the prism used having a a known value, the prism tested must be of the same value.

This method will also answer where the prism is in combination with one or two other lenses. The other lenses being perfectly neutralised the prism may then be neutralised. The adjustable triangle is perfectly useless when the prism is in combination with other lenses, simply because the surfaces of the prisms are covered with lenses which prevent the triangle from being applied to the prismatic surfaces.

Convex lenses are analysed in a variety of ways. *First*—The distance at which they will focus parallel rays of light measured in inches gives the number of the lens. To obtain parallel rays of light its source must be at a greater distance than twenty feet. Sunlight is most frequently used. *Second*—They are measured by a variety of instruments called foco-meters; the foco-meter designed by the author is the simplest and most perfect of this class of instruments. The principle involved in these instruments is the measurement of the effect which the introduction of any convex lens produces upon rays of light which are already sufficiently convergent to make the instrument very short, convenient and portable.

A convex lens, No. 60, is measured within an instrument ten inches long.

Third—They are measured by a concave lens of known value which will exactly neutralise the apparent motion of objects in the opposite direction when they are observed through a convex lens which is slowly shaken. The distance between the eye and any convex lens examined must be less than the focal distance of the lens, otherwise the action of the lens is reversed.

Concave lenses. They are measured as follows; *First*—By a foco-meter which registers the decreasing effect which they produce on a strongly convex lens system which is contained in the instrument.

Second—They are measured by the convex lens of known value, which exactly neutralises the apparent motion given to objects observed through a concave lens in the direction in which the lens is moved or shaken.

Simple cylindrical lenses. They have a line of no shake, this represents the axis of the lens.

The measurement of weak cylinders is possible by a foco-meter, but not as practical as the measurement of spherical lenses. The neutralisation of cylindrical lenses with other cylindrical lenses of known value gives results which are positively accurate.

Convex cylinders are measured by a concave cylinder of known value which entirely neutralises the apparent movement of objects in the opposite direction when the lens is shaken at right angles to its axis. Great care is necessary in testing cylindrical lenses to determine whether the two axes of the cylinders exactly correspond or not. Two cylinders which neutralise with corresponding axes will not neutralise if there is almost an immeasurable discrepancy in the parallelism of their axes. The axes of the cylinders can instantly be placed in a corresponding position by first placing them approximately in this position, then while looking through both lenses at distant vertical or horizontal lines as the corner or cornice of a building, rotate one lens on the other till these lines are perfectly continuous and straight. The axes of the lenses will then exactly correspond if the lenses are of the same power, the apparent motion of distant objects observed through them when shaken will have entirely disappeared, and the number of the concave cylinder used will be the number of the convex cylinder tested.

Concave cylinders have a line of no shake which represents their axes. A convex cylinder of equal power applied with its axis in a corresponding position will neutralise the lens.

Compound convex cylinders when shaken cause an apparent motion in opposite direction of distant objects observed through them. The motion is more marked in one direction than in the opposite direction. The line in which the apparent motion is least will be found to represent the axis of the stronger cylinder or the cylindrical lens in the combination. As there is no difference in the effect produced by a compound convex cylinder formed of two cylinders of unequal powers, and one formed of a spherical convex lens joined to a convex cylinder, we will analyse all *compound* or *crossed* cylindrical lenses as if they were sphero-cylinders. Neutralise in the line of the least apparent motion with a spherical lens; this being completed a simple cylinder alone is left in the combination. Hold firmly together in one hand the lens examined and the sphere selected. Take in the other hand a concave cylinder, carefully adjusting one upon the other by rotating until all distant objects appear square. By trial select a cylinder of the necessary power to neutralize the motion caused by the cylinder in the combination. The two lenses used in the neutralisation of the examined lens will represent the numbers of the lenses in the combination. The examined lens will have opposite values from the neutralising lenses.

Compound convex cylinders are analysed in like manner only with lenses of reversed values. The line of least shake is neutralised by a convex sphere, and the cylinder is then neutralised as above described with a convex cylinder.

Mixed and cross cylinders are analysed in a like simple manner. These lenses give in one direction an apparent motion to distant objects observed through them which is in the opposite direction, while in the reverse movement of the lens objects appear to move in the same direction.

The line of least motion is neutralised with a spherical lens, while the remaining motion in the line of the greatest apparent motion is neutralised by a cylinder which is always of an opposite value from the spherical lens used in neutralising the line of the least apparent motion. These rules will be criticised by many. They are not only practically and absolutely true, but the most learned mathematicians of the world pronounce the mathematical formulæ given in support of their correctness as being beyond criticism.

It has frequently been asked by students, why do all convex lenses when shaken give to distant objects an apparent motion in the opposite direction, while concave lenses give to objects under the same circumstance an apparent motion in the same direction the lens is moved? We judge of the position of an object by the direction of the light which comes from the object as it enters our eye. When the distance between a convex lens and the eye is considerably less than the focal distance of the lens and we observe a distant object through its centre, we receive convergent rays of light; if the lens is moved down we receive light through those portions entirely above the centre of the lens; this light will come from above, downward, consequently the object will appear to move upward more and more as the line of vision falls further above the centre of the lens. When the lens is moved *upward* so that the line of vision comes below the centre, the eye receives rays of light coming from below; consequently the object appears to move downwards.

We change rapidly by the lens the direction of the light which comes to us from a stationary object: this gives to the object an apparent motion in the opposite direction. In concave lenses this is reversed. When the line of vision passes from the centre, of the lens upward by moving the lens down, the eye encounters rays of light coming from below; consequently the motion of the lens and the apparent motion of the object is in the same direction.

At the exact focus of a convex lens there is no motion, and beyond the focal distance of the lens the light crosses and reverses the apparent motion of distant objects produced by the movement of the lens, thus producing divergent rays of light similar to those which come through concave lenses. These same peculiarities, which are true of concave and convex lenses in all meridians, are also true of concave and convex cylinders in the meridian at right angles to their axes.

New Books.

Electro-Metallurgy. By Alexander Watt.* — The ninth edition of this useful work, by the author of "Electro-Deposition," &c., has just been published. The present volume shows a considerable improvement over its predecessors. It is brought up to date with new illustrations and the most recent processes, including important additions to the Practical Notes, in which (among other matter) attention is called to the subject of cobalt plating with a view to promoting its recognition as a probably useful addition to the electro-plating industry. Some useful tables have also been added, which greatly enhance the value of the work as a manual of reference. In his Preface to this edition the author reminds his readers that during the present year will be celebrated the fiftieth anniversary of the art of Electro-Metallurgy: as it was in June, 1839, that Mr. Jordan's process was published to the world. A full index, useful tables (with the additions referred to), a list of articles required in electro-gilding and plating, together with the plain instructions that are given throughout the body of the work, make this an invaluable handbook to both the beginner and the practical plater.

The Eyes and their Sufferings. By Henry Steer, F.R.Hist.S.—This is a little treatise published by the author, a practical optician of Market Place, Derby, and written in the interest of suffering humanity, to guard the public against the quacks who abound in the trade, and their pamphlets. It also contains a useful warning to retailers against entering into some of the so-called "agencies" with certain advertising adventurers who have no right to the title "manufacturing opticians."

The Philosophy of Sight. By A. Fournet.†—This, as the title indicates, is a far more pretentious work than the foregoing, and deals with the function of sight in all its bearings to the other senses; its social-physical aspects, &c. In recommending the use of suitable spectacles for the preservation of the sight, Mr. Fournet adduces some good arguments from the optician's point of view as against the surgeon's, which he supports by interesting quotations from the *Lancet*. He is very much "down" on the *Face à Main*, the *pince-nez*, and the single eyeglass. In speaking of the first and last, after remarking on the shrivelling up effect the ogling of ladies, through the former, has upon a man of timid disposition, he says, "No, it requires more than a lion to put those glasses down. It requires a Cyclop, as with his long neck and high collar, he pivots round all of a piece, and darts his vision thro' that single orb with circular fitting from which something like a halter depends. Before the single orb all the double orbs and their fittings drop. That man is looking at you with one eye. It is an awful thing to be looked at with one eye. The air seems filled with sententious gravity. Your ears prick up in the expectation of a powerful monosyllable. You're trembling. He is gradually turning round toward you. His orb is on the off side, but he has caught sight of you. When he has gone through his evolution, you feel that the glass is not comfortable in that starboard port-hole. If it is the larboard hole that's glazed, the biped is left-handed. He lifts it out with a slow and measured deportment, two or three inches away. He bends the head a little; looks at you with both eyes, then presto! digs the glass back violently into the corner, and simultaneously appears to be cracking an imaginary nut. Teeth sometimes wanting. That's the instantaneous shutter. The picture would be too dark if it had been longer exposed. He makes you realise now that he is earnestly looking at you. He has mesmerised you. You can't speak. That constellation has thrown you out of your groove for a moment. On recovering from the seizure, you, personally, do not think much of that man. He trades upon distressing you, because impudence fathers his actions. Who can say such a thing? What cannot contradict it. Ruin—beggary—will make him use that glass, but not with the same tune. Poverty will then excuse that single eyeglass, where before the want of modesty condemned it God has given him two eyes—let him use them. Where a man is wearing a single eyeglass for reading by, it cannot be said to be offensive; because he is scrutinising matter—not personal matter—if you can consider yourself so much or so little. The single glass imparts an expression of anxiety to the features, as if the mind were leaning on one side trying to grasp a deep and abstruse thought. That very expression is an expression of pain, and the feelings of the crushed mortal who is being so ponderously observed are dazed. That single eye with its upper lid considerably propped up on the upper ridge of the glass is opened rather more than is natural. A solid foundation is provided by a raised cheek, the displacement of which discloses the tip of the upper canine, the pupil is turned well in towards the nose, the nostril on the same side being also a little raised. In fact everything on that side is raised: the ear seems as if it would like to come round to enquire what the eye was doing, it pricks up so. The scalp also is raised, and the hair, if any, seems as if it would like to stand on end too. I wonder if the picture can bark. Well, anyway, that's the expression—an expression of pain. But the observed has the double given him; it is so ponderous, so earnest, so fixed, that you feel it must be the look of you that is creating the pain. You can't imagine that the animal is adopting a painful attitude to see you. The expression is that of one coming upon something unpleasant, like a sore. When raising the cheek, you say, 'Oh, what a nasty thing! how you must suffer!' If he is reading a paper, he looks as if he were not pleased with the matter. It is just the same thing—you or the paper. He is seeing, after his painful manner. But what if he laughs? Oh, of course, down drops the glass. But then they seldom laugh; it is not decorous. What is the man playing at? He can't be playing at seeing properly. He can be playing at making you feel that he considers himself more important than you. That one eye is quite enough for him to see you with, and that at his own time. What would he say if a shoeblack were to act towards him precisely as he does towards others, and address him with a farmyard 'What?' He might be so wise as to take it whence it came, and say nothing. What would the world do in view of that action? Consider that he was thinking it a great impertinence on the part of the shoeblack. It is not the way to go about anything. It wastes people's time to make them wait in order to allow you to see them. What an amount of deliberation. Opinions ought to be solidly grounded after so much deliberation. However, that is known to be no guarantee. It is a grand advertisement to be the man with the single eye-glass. Quite a white raven. If he is going through the town in a hansom cab, with his hooked nose, and wearing a glass in his eye, you could imagine it to be a parrot on an excursion through civilisation. You feel uncomfortable to have been seen by him—it has an unpleasant sensation, because you repeat to yourself, 'that man had an eye-glass.' It seems as if his glance hurt you. It is not nice to be looked at with one eye. If a man has lost one eye, you much prefer to see him with a glass one in its place. It is more pleasant to imagine that he has two eyes. But though that man with a glass eye has two eyes, you can't help thinking that he is only looking at you with one eye. He is constituting himself gratuitously, and to yourself offensively—a cripple." The above is a long quotation, but though the bulk of the book is made up of more serious matter, it serves to show the style of the writer, whose lively imagination, taken in conjunction with his name (although that is not much to go by now-a-days) leads us to assume he is a Frenchman. Those interested in optics will find the perusal of this book well worth the trouble.

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* Price 3s.: cloth boards 3s. 6d. Crosby Lockwood & Co., 7, Stationers' Hall Court, Ludgate Hill, E.C.

† London. Swan, Sonnenschein & Co., Paternoster Square.

Our Lanes and Meadowpaths, By H. J. Foley,* and The Herts Border, by the same author, are two little shilling books descriptive of rural rambles in the vicinity of London. In the first named the walks are of distances varying from two to ten or twelve miles out, while the latter goes somewhat farther afield. Persons engaged in sedentary occupations through the week will find either of these books an excellent *vade mecum* for a Sunday outing through the by-ways that abound in the picturesque districts to the north of the metropolis.

Jewellery at the Paris Exhibition.

As accords with the fitness of things, Birmingham, the head-quarters of the jewellery trade, should derive the greatest educational advantages from the Paris Exhibition, and it seems as if its manufacturers are fully alive to the advisability of taking note of the doings of Continental workers. Writing as a maker of personal ornaments in a contemporary, a Birmingham jeweller speaks of a case in the annexe devoted to the liberal arts, the contents of which he evidently considers somewhat of a revelation to the English jeweller.

This case is occupied by the exhibits of two schools. One is the gratuitous Professional School of Artistic and Industrial Workers in the Precious Metals. The other is in the Concours Professionel of Young Workmen and Apprentices of the Syndical Chamber of Goldsmiths and Jewellers of Paris. We are informed that all work in this case is designed and executed by apprentices between the ages of twelve and sixteen years. It consists of models of *repoussé* work, of finished jewellery, real and imitation, and as such is one of the most remarkable cases in the Exhibition. It shows us the true basis of French excellence in design and finish. There is no royal road to art; and in the specimens shown by mere boys at an age when most English boys are engaged in conjugating the verb "to be" in one or more languages, these young workers—mostly of humble origin—have made such strides in their respective industries as must have involved years of patient and thoughtful toil. Even the examples of die-cutting for imitation jewellery show such a mastery of tools, and capability of expression as are simply astounding. It is enough to make the hair of an English technical school manager stand on end; and, while no doubt the work of the cleverest and most industrious pupils has been put in this case, it is clear that no other nation than France could have shown such work of boys from twelve to sixteen years of age. The practical jeweller sees at a glance how much leeway England has to make up before her sons can take the palm for artistic jewellery.

Having looked at the beginning of French art in personal ornaments, let us return to the main building, and going under the centre dome, glorious with colour, both without and within, we find on our left immediately the two courts marked, "Bijouterie, Jouaillerie," where the French display is seen in its perfection. The lessons of youth have ripened and perfected with manhood. Bapst with his diamonds, Boucheron with his special pieces, Savard with his work for the middle classes, Decaux and others with their die work for cheap jewellery—all are great in their respective lines. Let us note a few special features. As to diamonds, their number and value are most bewildering. Nearly every case teems with them. They only become remarkable when they include a new mounting of historic gems, such as those of the Crown jewels of France, or when they consist of an unusually fine spray of flowers, or a novel application. Thus Richstadt has a fine spray with carbuncle cherries—*devants de corsages*, where diamonds mingle with lace in a particularly charming way, and diamond-set epaulettes. He has also brooches imitating a dessert plate, where onyx and cat's eye berries are temptingly spread, and whose cases are little wicker baskets. Speaking of the revived taste for natural flower imitations in jewellery, the writer continues: The diamond flower wreath or spray is half a century old or more, yet it is now apparently the rage again with the very rich. It has been the custom of titled owners of grand sprays for the last twenty years to have these pieces remodelled. They have been brought into geometric forms as tiaras, bracelets, necklaces and pendants. But the taste for natural flowers, which has grown so abundantly during the last few years, has been followed by the jeweller. He has given us flowers in a more permanent form, but also with a difference. He has called enamel to his aid, and has thus broken down one of the traditions of the modern school. What is called the "one-colour theory" has held sway for a long time. This theory is that the jewel should be of one colour, the dress of the wearer forming the contrasting colour, and thus completing the harmony. The latest idea is a return to the old mediæval conception—that the jewel may be of several colours, and need only harmonise with itself. Thus the fashion of wearing flowers has been the cause of all this, and enamel has been the medium. Ancoe fils have a beautiful spray of wild rose—pink and butterfly enamels occur in profusion; but, admitting as it does, of the most startling forms, effects and colours, the orchid is the favourite flower. It ought certainly to gratify the eyes of Mr. Joseph Chamberlain, as member for the jewellers' quarter in Birmingham, to find how much the Parisians affect his favourite flower in artistic jewellery. The largest exhibitors of this particular class of work are Messrs. Tiffany & Co. This is the great house of Broadway, New York, and they are located in the United States Section, but they have wisely established a branch house in Paris, with a view to catch their customers again in that paradise of travelling Americans; so that they may be regarded as, in point of fact, French jewellers. All their exhibits, indeed, are in French taste and style.

Bapst, followed by a host of others, has carried the idea of several colours in the jewel to still greater lengths. He has set himself in a number of instances to reproduce the old mediæval jewellery, of which we have a series of examples in the specimens lent by Mr. Gladstone, which are now in the Birmingham Art Gallery, and which is also very fully represented in South Kensington Museum. The delicate and elaborate fancies of the *Renaissance* are reproduced with a fidelity which leaves nothing to be desired. But the question next arises, "Are these about to become popular fashions?" The very cost precludes this. The natural enquiry ensues, "What is the next step?" Savard, perhaps, best answers this question, so far as Paris is concerned, by displaying a large assortment of middle-class jewellery in the polished red gold which is most affected in Paris, where *Renaissance* scrolls, richly and boldly chased, give lightness and variety to the jewel, aided by centres and interspersed gems. Two things would seem to be evident—(1) that the very narrow bracelet is likely to be replaced by a much wider ornament; (2) that the fichu brooch is a fading quantity. Instead of the narrow and wire-like bracelets and bangles to which we are accustomed in England, we have bracelets from a half-inch to an inch-and-a-half in width, decorated in gold, with a variety of treatment, chiefly *Renaissance*, with diamonds, pearls and

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[*] Truslove & Shirley, 7, St. Paul's Churchyard, E.C.

coloured stones at intervals. If trade prospers and Paris fashions rule—as they most likely will—it may be of little avail for fathers of families to hope to satisfy their daughters with presents of the narrow gold bangles at 30s. each which have hitherto been available. The next thing is the long narrow brooch, called the fichu brooch, which by its very name denotes its French origin, and which first made its appearance in full force in the Paris Exhibition of 1878. Two years afterwards, as I ventured to prophecy, the taste was firmly rooted in England, and now it has come to pass that the small wire-mounted lace brooches, which are simply the continuation of the fichu brooch, are labelled in Paris shops as "Epingles Anglaises." Parisian taste has gone in the direction of small round brooches of the size of the ordinary solitaire, and it now remains to be seen whether the rest of the world will follow suit.

But if republican France has distinguished itself in one way more than another, it is in reviving in all their splendour the styles of its last line of kings. Louis Quatorze, Louis Quinze, and Louis Seize—these motives are all the rage. Styles of the Decadence, representing in reality the successive degradations of the *Renaissance*, exquisite in treatment, but amusing in their slavish fidelity to the models of each period—these meet the eye at every turn. They seem to have begun in jewellery with little Watteau miniatures in ivory or in enamel, with gold borders of scrolls touching at the ends, having no constructive relation to each other. This has extended until almost every portrait of a fashionable beauty in the picture galleries has a frame of similar style. It does not stop at jewellery. To say nothing of combs and brushes, card-cases, pocket-books, albums and writing cases, watches, timepieces, purses, mirrors, table ornaments, dessert and tea services all bear witness to the furore with which the French designer has pursued his favourite theme. Even Tiffany's finest pieces are framed upon the same lines; while Boucheron has a tea service the tray for which, containing groups of altogether over 100 figures, has, he informs me, taken more than two years to engrave.

This latter jeweller, who prides himself on never making two pieces alike, has certainly a *tour de force* in the Exhibition. It is a smoked crystal pilgrim-bottle, about eighteen inches high, with a wonderful dragon twisting himself through the centre circle and about it, enamelled body, wings, head, feet, and tail, with every variety of colour. It is a masterpiece of execution, though the utilitarian may ask *Cui bono?* Joret has a curious onyx-and-enamelled vase; Dufresne a scent bottle, lapis lazuli and *repoussé*, also daggers of quaint conceits. Jewel-caskets, richly wrought and enamelled, meet us on every hand. Brunest has a wonderful chessboard, with lapis and onyx squares, with chessmen equally remarkable. Biele and Billaut have remarkable work in black silver; and Silvestre distinguishes himself by such gorgeous babies' rattles that the fathers of those for whom they are destined should be nothing less than millionaires. Snuff-boxes, chatelaines, bouquet-holders, and baskets of flowers all testify to the ability of the Parisian jeweller to minister to the tastes of the very rich.

The Properties of Gold.

FLORENCE O'DRISCOLL has just published an interesting book on the chemical and physical properties of gold, which, even to many of those to whom its commercial and mechanical properties are well enough known, affords a good deal of useful information. The fusing point of gold is 2,016° Fahr., or 1,102° C., its density—which falls with almost every alloy—19·5; its hardness 2·5 to 3, and its atomic weight 196·85. Of itself it is not volatile, but at temperatures considerably above fusing point it will give off metallic vapours if after mixing with lime, magnesia, or silicia it is subjected to the flame of a blow-pipe. The purple sublimate which forms, when examined under the microscope, is seen to consist of minute particles of crystalline gold; but if a globule of metallic gold be subject to the same flame no sublimation or alteration in size will result. Its extreme malleability may be gathered from the fact that one grain may be beaten into leaf until it covers a superficial area of 56 inches, and is of a thickness equalling 1,280,000th of an inch. As regards its ductility one grain may be drawn into a wire of 500 feet long—the grain itself being about equal in size to a No. 9 shot, and measuring ·073015 inch in diameter. The value of pure gold at the London Mint is £4 4s. 11½d. per ounce troy—roughly stated at 4s. 3d. per pennyweight, and 2d. per grain. Native gold is almost always found alloyed with a proportion of silver, while rhodium, palladium, mercury, copper, iron and bismuth are amongst the other metals with which it is found naturally alloyed. It is soluble in nitric and hydrochloric acids—aqua-regia—in sulphuric and nitric acids, in nitric and nitrous acids, in selenic acid, in iodic acid, in soluble cyanides, and in a number of other chemical substances under various conditions. It is also convertible into soluble salt by the elements chlorine, bromine, and iodine.

Value of Watch Companies' Plants in America.

MR. AMBROSE WEBSTER, of the American Watch Tool Company, Waltham, Mass, is on a European tour of combined business and pleasure. Visiting us at our office the other day, he expressed himself as very much pleased (as he ought to be) with the get up and general lines of the *Watchmaker, Jeweller and Silversmith*, and in the course of conversation furnished us with the following estimated particulars of the plant and output of American watch companies. As a great proportion of the machinery used in the American factories has been manufactured by his firm, these particulars form a tolerably just, as they are also an interesting basis for comparison:—

Factory.	Value of Plant.	Daily Output.
American Waltham	3,000,000 dols.	1,500
Elgin National	3,000,000 ,,	1,500
Illinois	1,000,000 ,,	600
Waterbury	500,000 ,,	1,000
Hampden	400,000 ,,	200
Seth Thomas (watches only) ...	150,000 ,,	100
Trenton	200,000 ,,	200
New York Standard	150,000 ,,	150
Cheshire	150,000 ,,	150
Manhattan	100,000 ,,	125
Keystone	100,000 ,,	100
United States	100,000 ,,	50
Peoria	100,000 ,,	100
Columbus	150,000 ,,	125
Aurora	150,000 ,,	100
Rockford	150,000 ,,	100
E. Howard	150,000 ,,	20
	9,550,000	6,120

It is stated that nothing is better for cleaning silver than the following: Boil one ounce of finely pulverised hartshorn in one quart of water. Leave the vessel on the fire and put the silver-ware into it; boil for a time, take it out, drip it over the vessel and let it dry at the fire. Continue until every article has been treated in this manner. Next, place clean linen cloths in the water and let them become saturated. When taken out and dried, use them for polishing the silver. Rub the ware with the cloth and finish with soft leather. These rags are at the same time excellent for cleaning articles of brass—signs, door knobs, &c.

Aluminium and its Manufacture by the Deville-Castner Process.

By William Anderson, M.Inst.C.E.*

(Concluded from page 18.)

ALUMINIUM forms alloys with most metals. Iron is always more or less associated with it, but it seems doubtful whether it be a true alloy, or wholly or in part a mixture, like the carbon contained in cast iron and steel. Silicon is also invariably found associated, more or less, with the metal. Aluminium added to molten iron and steel lowers their melting points, and consequently, increases the fluidity of the metal, and causes it to run easily into moulds and set there, without entrapping air and other gases, and forming blow-holes and similar imperfections. It is, in consequence, used to the extent of about ½ per cent. and less by some steel founders, and seems to render the production of sound steel castings more certain and easy. Admiral Kolokolzoff, the director of the great gun factory near St. Petersburg, informs me that he uses ferro-aluminium, an alloy with iron, containing 10 per cent. of aluminium, and adds it to the crucibles of melted steel, about ten minutes before pouring, in the proportion of one pound of the alloy to 80 pounds of steel, which gives one part in 800 of pure aluminium, and the result is that he gets the largest steel castings, such as I have myself seen, completely free from air-bubbles, and with very excellent mechanical properties.

One of the most remarkable applications of the property which aluminium possesses of lowering the melting point of metals has been made by Mr. Nordenfelt, in the production of castings of pure iron, that is to say, iron free from any sensible quantity of carbon or manganese. Pure iron melts at about the same temperature as platinum, that is, about 1700° C. yet, even then, the molten mass is not liquid enough to be run into moulds, but the addition of from $\frac{1}{2000}$ to $\frac{1}{700}$ part, by weight, of aluminium lowers the melting point to such an extent that it becomes fluid enough to run into the most minute and intricate forms. Mr. Nordenfelt has given the name of mitis (flexible ductile), to his metal, and I am indebted to Mr. Faustman, one of the inventors of the process, for the interesting collection of mitis castings, which is here before you. I would especially draw your attention to this wire brush; it is a solid casting; the back and iron bristles form one mass, and yet, you can see, that the bristles may be bent about just like the softest iron wire.

The process of manufacture is as follows:—Wrought iron is placed in crucibles, which are put into a liquid-fuel air-furnace of peculiar and ingenious construction. In a furnace for six crucibles, for example, they are arranged on an elongated hearth in pairs, cross petition walls being so built as to cause the flame to embrace each crucible thoroughly. In the roof of the furnace are openings, covered by moveable, brick-lined plates, or doors, through which the crucibles can be got at. The flame playing over the hearth is conveyed by a short flue, fitted with a damper, to the chimney. Under the hearth is another flue, communicating with the furnace, and also leading to the chimney, and fitted with a damper. By manipulating the two dampers the flame may be directed either under or over the hearth at pleasure. The furnace proper is at the end of the hearth farthest from the chimney, and consists of a peculiary constructed apparatus, whereby the cheap residues resulting from the distillation of kerosene, or the heavy oils obtained from gas works, can be burned with the ordinary chimney draught, and a most intense heat produced. The pair of crucibles next the furnace are the most highly heated, the metal in them melts first, and, as soon as the crucibles are removed for pouring, the remaining four are moved up near the flame, and two freshly charged ones put in at the end nearest the chimney, by which means most of the heat produced by the combustion of the fuel is utilised. As soon as the iron is fairly melted, but not overheated, aluminium is added, when the charge instantly becomes quite fluid, and fit for pouring, the lowering of the melting point having had the same effect as superheating the metal.

The mitis castings possess all the properties of the best forged iron, the tensile strength ranging as high as 27 tons per square inch, with an elongation of 20 per cent. The metal can be worked and welded just like wrought iron, and in fact cannot be distinguished from it, except that it is perfectly homogenous and free from stratification.

When aluminium is used in such small quantities, it is best to make a preliminary rich alloy with iron, say one containing from 10 per cent. to 25 per cent. of aluminium, and then to add so much of the alloy to the charge in the crucibles as will give the desired proportion of the more costly metal. This is the more necessary on account of the extreme lightness of aluminium, which makes it reluctant to mix with a metal three times its specific weight.

Aluminium alloys readily with copper in all proportions, and constitutes the metal known as aluminium bronze. The usual proportion ranges from 2½ to 10 per cent. of aluminium, and it is probable that the bronzes resulting form true alloys or solutions, because the addition of a lighter metal causes a marked increase of temperature of the molten mass, indicating the existence of chemical reaction, and the bronzes may be melted frequently without changing the relative proportion of the constituent metals. The tenacity and rigidity of the copper is much enhanced; 10 per cent. alloys having sustained as much as 45 tons per square inch, with an ultimate extension of 25 per cent. It must be remembered, however, that, to obtain the best results, absolute purity, or, at any rate, fixity of composition, both in the copper and aluminium, must be insured; failing that, very discordant and disappointing results will be arrived at. The aluminium alloys of copper, up to 10 per cent., can be forged, and rolled hot, and worked as readily as copper, proper precautions with respect to annealing being observed. The colour of the aluminium bronzes approaches very nearly that of gold; the metal takes a high polish, and is less liable to tarnish than ordinary bronzes, or than copper itself.

Aluminium forms alloys with most other metals, but they possess no practical value at present, and, therefore, need not be described.

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[*] From a Paper read before the Society of Arts.

Workshop Memoranda.

To straighten a Bent Pivot.—Place the pivot in a slot of the Jacot tool and press on it with a smooth burnisher while causing the staff or arbor to rotate. Sometimes a bent pivot can be straightened with a pair of pliers, but in this case very careful manipulation is required in order to avoid breaking the pivot.

Silver Cleaning Liquid.—Prepared chalk, 8 ozs., turpentine, 2 ozs., alcohol, 1 oz., spirits of camphor, 4 drachms, liquor of ammonia, 2 drachms. Apply with a sponge, and allow to dry before polishing. Another preparation is a solution of cyanide of potassium, 12 oz. cyanide to 1 quart of water. Immerse the silver, brush it with a stiff brush until clean, wash and dry.

Jewellers' Cement.—Dissolve five or six bits of gum mastic, the size of a pea, in as much spirits of wine as will suffice to render it liquid. In a separate vessel, dissolve as much isinglass (previously softened in water, though none of the water must be used) in rum, or other spirit, as will make a 2-oz. phial of very strong glue, adding two small pieces of gum ammoniacum, which must be rubbed or ground until they are dissolved; then mix the whole with a sufficient heat. Keep it in a phial closely stopped, and when it is to be used set the phial in boiling water. This cement will unite almost all substances.

To Upright a Barrel.—Finishers have several methods for getting the barrel upright: but, assuming that the barrel does not require new holes, the following—one of M. Saunier's methods—will be found a suitable means for a repairer to accomplish the object: first, try turning the cover round in its groove by successive short stages, and test its truth each time; the arbor being clamped in a pair of sliding-tongs and a card held close to the teeth. If, after the entire circumference has been thus tested, no point is found that satisfies the requisite conditions, the edge of the cover must be gently hammered (a piece of silver paper being first laid on the anvil, so as to avoid marking the gilding) on the side at which the teeth pass farthest from the card, and the effect of the operation must be tested. The hammering should be done very carefully and little at a time, and if too great a strain is put on to the cover to force it into the groove, some metal must be removed from the side opposite to that at which the hammering occurred. If the one side is too much extended in the first instance, so that a large amount of metal has to be removed from the opposite side, the operation will be long and difficult. Of course, the barrel referred to is the ordinary form of going barrel, in which the cover is on the opposite side to the teeth; in the older form, where the reverse is the case, the opposite edge of the cover must be hammered. Sometimes a barrel that runs true on its arbor is found to incline when mounted on the plate; such a fault is due either to the barrel holes being too large or to the sink that receives the ratchet not being parallel to the plate. This sink must be trued in the mandrel while in position, screwed to the plate of the watch.

Minor Briefs of the Past Month.

Divorce.—Mrs. Isabella Hamilton, or Higgins, obtained a divorce from her husband, sometime a Glasgow jeweller.

Suicide.—Ralph Gorst, 24 years of age, a dealer in jewellery, of 57, Mile Street, Liverpool, committed suicide by taking (it is thought) cyanide of potassium, while temporarily insane.

Alleged Illegal Pawning.—William Charles Hands, the Norwich jeweller against whom the grand jury found a true Bill for misdemeanor in connection with his recent bankruptcy, was discharged, the common jury having brought in a verdict of not guilty.

Interpleader.—Mrs. Green, the wife of a commission agent of that name, and F. Thomas Green, his brother, recovered £10 and £5 12s. 6d. respectively, from Mr. Thomas Fox, watchmaker, of Canterbury, on an interpleader, which showed that some goods seized under an execution belonged to the claimants.

A Clock Case.—Mr. H. Jacobs, of 14, Cursitor Street, sued a person named Goodchild for £1, the value of a clock sold and delivered. The defence was that plaintiff had consented to be paid half in kind, which, together with 10s. in money had been paid, and that a receipt which plaintiff had given was torn up at the time when defendant's back was turned. Judgment for defendant with leave to have a jury.

Shop Robbery.—William Gailey was charged at Dalston, with stealing from the shop of Mr. Robert Triggs, jeweller, of 341, Mare Street, Hackney, jewellery to the value of £25. While Mr. Fish, an assistant, was standing at the shop door, a confederate of the prisoner drew his attention to something in the window; and his suspicion being aroused he hurriedly returned and met the prisoner coming out with the goods in his hands. On the prisoner promising to give information, he was released on bail.

The Tally System.

IN the City of London Court last month, Mr. Commissioner Kerr gave a few judgments, accompanied by appropriate remarks, which should go some way to discredit the selling of goods on the tally system. We append herewith a *résumé* of some of the cases:—

Kendal & Dent v. Simmons.—The defendant Simmons was said to be a luggage labeller. A representative of the plaintiffs, Messrs. Kendal and Dent, 106, Cheapside, said the defendant earned 14s. a week, besides which he had perquisites. The £2 1s. owing was for a sample watch supplied. The learned Judge: "What has a man like that got to do with a watch when he can see the time whenever he likes by going into the railway station? You had better get back your watch." The plaintiffs' representative said that the defendant had parted with it. The learned Judge: "Then why did you part? You deserve to lose it, giving these people watches. What business have they with watches? Ten days."

The same v. Cooper.—The debt in this case was £1 13s. 6d. also for a watch supplied by the plaintiffs to Mr. A. M. Cooper, of Stationers' Hall-court. His Honour said that if people supplied watches on the tally system they must take the consequences. He made an order for payment of 2s. a month.

Yarsley v. Burdin.—The plaintiff sought to recover £1 16s. from A. Burdin, of the West Kensington Stone Works, Hammersmith, jewellery supplied. The plaintiff said that the defendant's master had told him that he (the defendant) was in receipt of £1 19s. a week. His Honour: "Very well, subpœna his master next Saturday."

Yarsley v. Middleton.—The defendant in this case was W. Middleton, a police-sergeant, living at 65, Craford Road, Holloway, from whom the plaintiff sought to enforce payment of a debt of £1 3s. His Honour: "This man writes to say he is a police-sergeant at Holloway, and he cannot attend the Court because he is in attendance on the Shah. Is this for jewellery too?" Plaintiff: Yes, your Honour. His Honour: "Very well: here we have a police-sergeant going in for jewellery. What is his salary?" Plaintiff: I am unable to state that, sir. His Honour: "Very well, then: subpœna Mr. Monro, Chief Commissioner of Police, next Saturday. Adjourned."

The New Gold Fields in Lower California.

GREAT interest is manifested at the present time all over the Pacific coast, in the new gold fields of Santa Clara, in Lower California, and there is very little abatement in the mining excitement in either Los Angeles, San Diego, and other towns of Southern California, during the last few weeks. People are leaving in large numbers daily from all these places for the scene of operations, whilst Ensenada is said to be nearly deserted. The mines are situated in the mountains, says a contemporary, at a distance of between 50 and 60 miles from this latter town, which is a small seaport 50 miles south of the United States and Mexican boundary line. Although only discovered on the 23rd February, there are already between 2,000 and 3,000 persons camped in the Santa Clara valley, in which the new gold field is situated, and fully as many more are now on their way from Southern California and Arizona. The mines are situated at an altitude of 4,500 feet, and the operations are carried on in three gulches. As yet, little is being done except in placer mining, and this is conducted in the most primitive manner. The dirt is very easily handled, and in some instances has given very rich returns. The dry placers continue to furnish the largest nuggets. Old miners say they have never seen such large pieces of gold taken out of the ground. Bed rock is but a few feet down, and when the boulders are reached, the pick and shovel are laid aside, as scratching with knives and horn spoons begins; the dirt is carried out to the water and is panned. At the present time water is plentiful in these gulches. Rockers and other improved machines are scarce. It is not, however, in the placers, that the future of these mines will depend, but rather in the quartz rock, of which three well defined gold bearing lodes are known to exist; these descend from the mountain in three gulches, in the most northerly of which the richest finds have been made. One of these lodes has been traced on the surface for a distance of 1,400 feet. Mining experts look for rich discoveries as soon as the snow disappears from the mountains. The extent of the placers is limited, and at the present rate they must soon be worked out. From all accounts, however, the Santa Clara mines are undoubtedly the richest that have been discovered on the coast since 1849.

The Mineral Wealth of the United States.

THE sixth report on "The Mineral Resources of the United States," by David T. Day, Chief of the Division of Mining Statistics and Technology, United States Geological Survey, is to be issued shortly. This report is for the calendar year 1888, and contains detailed statistics for this period, and also for preceding years, together with much descriptive and technical matter. The following are the totals of the production of some of the more important mineral substances in 1888:

Metals.

Gold and Silver.—According to the Director of the Mint, the gold product was 1,604,927 fine ounces, valued at 33,175,000 dollars. This is about the same as in 1887, being an excess of only 75,000 dols. The silver product was 45,783,632 fine ounces of the commercial value of about 43,000,000 dols., and of the coining value of 59,195,000 dols. This is an increase of 4,515,327 ozs. over the product in 1887. In addition to the product of our own mines some 10,000,000 ozs. of silver were extracted in the United States from foreign ores and bullion.

Copper.—The total product, including the yield of imported ores, increased 231,270,622 lbs., or 115,635 short tons, during 1888, which is 46,053,291 lbs. more than the product of 1887. During the first quarter of 1889 the production was increasing at even a more rapid rate. The prices received by American producers averaged 15½ cents per lb. for Lake copper, 14½ cents for Arizona, and 14 cents for other districts, making the total value 33,833,954 dols. Montana led in the production, making 97,897,968 lbs. Consumption was somewhat reduced by the high prices.

Lead.—The product increased to 180,555 short tons from 160,700 tons in 1887. The increase was due principally to the heavier receipts of lead in Mexican silver-lead ores, from 15,000 tons in 1887 to over 27,000 tons in 1888. The average price in New York was 4·41 cents per lb. The production of white lead, chiefly from pig lead, was 89,000 short tons, valued at 10,680,000 dols.

Zinc.—The erection of new works and the extension of old ones led to a further notable increase in the production of zinc in 1888. The additions to capacity were fairly uniformly distributed in the West, East, and South. Production in 1888, 55,906 short tons, with a total value of 5,500,855 dols.; in 1887, 50,340 tons, worth 4,782,300 dols. The production of zinc white in 1888, directly from ores, was 20,000 short tons, worth 1,600,000 dols.

Quicksilver.—The product was 33,250 flasks (of seventy-six and a half pounds each) from California, a decline in that State of 510 flasks from 1887 in spite of a very satisfactory price, which average 42 dols. 50 cents per flask, making the total value 1,413,125 dols. No new valuable deposits were discovered in 1888, and without them it is not probable that the yield of quicksilver will increase.

Nickel.—The industry remains unchanged except for indications of further developments at Lovelock, in Nevada, and Riddle, Oreg. The product includes 190,637 pounds of metallic nickel, valued at 114,382 dols., at 60 cents. per lb., and 4545 lbs., worth 1136 dols., exported in ores and matte. Total value, 115,518 dollars. The corresponding value in 1887 was 133,200 dols.

Cobalt Oxide.—The total product, including the contents of the exported ores and matte was 12,266 lbs., worth 18,441 dols. In 1887 the total was 18,340 lbs., worth 18,774 dols., the lower rate of value in that year resulting from a larger proportion of exported nickel in matte and ore. The price of cobalt oxide remained at 2 dols. per lb.

Chromium.—The product declined from 3,000 tons in 1887 to 1,500 tons in 1888. The average price in San Francisco remained 15 dols. per ton. Increased operations are probable in 1889.

Manganese.—The product of manganese, and manganiferous iron ores in the United States in 1888 was 236,460 tons, valued at 876,215 dols. Of this amount some 25,500 tons would be classed as manganese ores; the remainder as manganiferous iron ores. Of the manganiferous iron ores 11,462 tons, averaging 11 per cent. of manganese, and 189,574 tons, averaging 4 per cent. of manganese, were from the Colby mine, Michigan. In addition to the above, some 60,000 tons of argentiferous manganese ores, valued at 10 dols. a ton, chiefly for the silver contained in them, were produced in the Rocky Mountain region.

Aluminum.—The past year was more promising than ever before for the production of cheap aluminum. The production of metallic aluminum as an industry distinct from the production of alloys began toward the close of the year, and 500 lbs. had been made up to December 31; the production of 3,000 lbs. since then indicates that the industry may continue. The exact amount of alloy produced by the Cowles process has not been furnished, but was not markedly different from the product of 1887, when 18,000 lbs. of aluminum contained in bronze and ferro aluminum were produced. The price for metallic aluminum declined to as low as 4 dols. 50 cents per lb. for less favoured brands.

Platinum.—Including the platinum and iridium separated from gold by the assay offices and that saved in placer gold mining, the product was about 500 ounces, valued at 2,000 dols.

MISCELLANEOUS.

Grindstones.—Ohio and Michigan furnish practically all the sandstone from which grindstones are made. The product in 1888 increased slightly, 41,000 long tons, worth 281,800 dols., being produced, against 37,400, worth 224,000 dols., in 1887. The price varied from 6 dols 50 cents to 10 dols. per ton at the quarries before being finished into grindstones.

Corundum.—Production is limited to the old mines in North Carolina and Georgia; 589 short tons, valued at 91,620 dols., were produced in 1888, against 600 tons in 1887.

Oil-Stones and Whetstones.—The production of novaculite from Arkansas increased slightly, making the total, including Labrador oil-stone, etc., 1,500,000 lbs, valued at 18,000 dols. in the rough state.

Precious Stones.—No systematic mining was carried on in search of gems in 1888. But in mining for other substances and in chance discoveries, gems worth 64,850 dols. in the rough state, and gold quartz worth 75,000 dols., were found.

Phosphate Rock.—The production declined to 433,705 long tons, but the total value increased slightly to 1,951,673 dols. on account of better prices. The trade in manufactured fertilisers was very prosperous.

Marls.—The production in the southern states, particularly in Virginia, North Carolina, Alabama, Mississippi and Florida, is increasing, while the product of New Jersey did not vary from 1887. About 600,000 tons, valued at 300,000 dols. were produced.

Bromine.—The product was 307,386 lbs., worth 95,290 dols., an increase from 199,087 lbs. in 1887, worth 61,717 dols. The price remained at 31 cents per lb.

Borax.—The product was restricted to 7,589,000 lbs., worth 455,340, at 6 cents per lb for the average quality. In 1887 the product was 11,000,000 lbs., worth 5 cents per lb.

Sulphur.—The sulphur refinery in Utah was partially burned. This and litigation over the property prevented any production in 1888. The supply came principally from Sicily, with small importations from Japan. It was practically all made into sulphuric acid.

Pyrites.—Production 54,331 long tons, valued at the mines at 167,658 dols. : a slight increase in quantity over previous year.

Barytes.—The production from Missouri, Virginia, and New York increased to 20,000 long tons, worth at the mines 110,000 dols. In 1887 the product was 15,000 long tons, worth 75,000 dols.

Gypsum.—The domestic supply comes principally from Ohio and Michigan, with smaller amounts from New York, Virginia, Kansas, Colorado, California, Dakota, and Utah. The product in 1888 was 96,000 short tons of crude gypsum, valued at 430,000 dols. A large portion of the supply is imported from Nova Scotia, where 126,118 tons, worth 121,579 dols., were produced in 1888.

Ozocerite.—From the region of Soldier's Summit, Utah, about 20,000 lbs. of crude mineral wax were produced, worth 1,000 dols. in New York, where the material was sold. An increase is probable in 1889.

Soapstone.—Production about 15,000 tons, worth 50,000 dols. before shipment.

Mica.—Owing principally to the use of smaller sizes in stoves, the production of sheet mica decreased from 70,500 lbs. in 1887 to 48,000 in 1888, valued at 70,000 dols.

Mineral Paints.—The product, including ochre, metallic paints, and small amounts of umber and sienna, increased to 24,000 long tons, valued at 380,000 dols.

Graphite.—The production of pure graphite was limited to Ticonderoga, N.Y., and is reported as unchanged. The total production of pure material was 400,000 lbs, worth 33,000 dols. Small amounts of less pure material for foundry facings, etc., were produced in North Carolina and at Cranston, R. I.

Zircon.—During 1887 and 1888, 25 tons of zircon were mined, principally in Henderson County, North Carolina, and sold for 10,000 dols., for the manufacture of incandescent gas burners. About four tons of monazite, one ton of allanite, 600 lbs. of samarskite, and 500 dols. worth of yttrium minerals were produced for the same use. About six tons of monazite and five tons of cerite were also imported.

Totals.—The total value of the minerals produced in 1888 was 591,659,931 dols. It is recognised that this is the sum of the values of substances taken in various stages of manufacture, and hence not strictly comparable with each other ; still it is the most valuable means for collecting the total products of different years. The result is an increase of nearly 50,000,000 dols. beyond the value of the product in 1887. In that year nearly every mineral industry showed an increase, and hence an increased total was evident. But the fact that the increase was so very large was due to rather exceptional conditions in a few important industries, and it could not reasonably be expected that a similar combination of circumstances would result in even a larger total value for 1888. Nevertheless, the unprecedented stimulus given to the production of copper by an artificial price increased the total value of that product nearly 13,000,000 dols., or nearly enough to offset the decline in the total value of pig iron. The other important factors in the increase were coal and the other fuels, which followed the increased quantities of metals. With the anticipated decline of copper to the normal demand, a decline in the total value of the product in 1889 will not be inconsistent with the natural development of our mineral resources.

Searching for Gems in Ceylon.

A CORRESPONDENT of the *Ceylon Observer*, in a recent issue of that journal, describes the district in Ceylon in which gems have hitherto been most commonly found, and the method employed by the natives in digging for them. Ratnapura, or "the city of gems," is the centre of a district 20 to 30 miles square, in almost all of which a stratum of gravel 6ft. to 20ft. under the surface exists. Throughout this area gem pits are to be seen near the villages, some being worked now, others being abondoned. The natives work there in companies of six or eight, and pay a rupee per man per month for the privilege of working a certain allotment, where they begin by marking off a square of about 10ft. After removing about 3ft. of soil, the sounding-rod, a piece of iron about half-an-inch in diameter and 6ft. long, is used to sound for the gravel. If successful, the digging is begun in earnest till about 4ft. deep. On the second day gravel is taken out by means of baskets handed from one man to another till all within the square is excavated. Should the miners find the soil fairly firm at the bottom of the pit, they tunnel all round for about 2ft., drawing out the gravel and sending it up also to be heaped with the rest, which usually completes the work of the second day, a watchman remaining near it all night. On the third day it is all washed in wicker baskets by a circular jerking motion, which throws out all the surplus light stone and rubbish, till a good quantity of heavy gravel is left in the bottom, which is carefully examined. There is hardly a basketful that does not contain some gems of inferior value, which are usually sold by the pound for about nine rupees. Should no valuable stones be found another pit is sunk, and so till one or perhaps two or three really valuable gems are unearthed, when the work is stopped, and the whole party goes off to Ratnapura with the prizes. If these are worth, say, a few thousand rupees, they are kept secret and only shown to one or two men of money, who make the owners an advance and look after the safe custody of the precious stones. Then they gamble and drink for some time till another advance becomes necessary, and so on till half the value is obtained. Then the party, with the mortgagee, proceeds to Colombo, or Italutara, where rich Moor traders are summoned to purchase, and the gems soon find their way to London. The general public know nothing about these transactions, and valuable gems are never heard of in Ceylon, and scarcely see the light of day till they reach Bond Street. The natives have a great fear of exposing their finds till they are sold, and they have most extraordinary superstitious ideas about showing them. This system has been in vogue for centuries past. It is only occasionally one hears of any native having enterprise enough to dig a few feet below the first gravel to see if, by sounding, a second bed of gravel is within easy reach, for they fear the expense of baling out water, which increases as the greater depth is attained, although the second gravel is well-known to be much richer than the first.

Industrial and Professional Education in Belgium.

MUCH attention is given to technical education in Belgium by the State and cities, and this is given in workshops for apprentices, in industrial schools, and professional schools for girls and boys.

The workshops for apprentices are, according to a contemporary, chiefly confined to youths in the country who devote a part of their time to weaving linen, or other work, such as carpets and common stuffs, according to the localities where the schools are established. There are 45 of these schools of apprenticeship in West Flanders, and nine in

East Flanders. A superintendent or director is attached to each, who, besides giving practical information as to work, is equally bound to give theoretical information on the art of weaving, all kinds of fabrics being successively studied. The object of the industrial schools is to give to the workmen that scientific instruction which he could not acquire in the workshop, and thus give him the means of bettering his condition, developing his intelligence, by initiating him into the general laws which belong to the transformation of materials, thus taking him out of the mere trammels of routine, increasing the economic value of his work, and enabling him to increase production and enhance his wages.

These schools are intended to promote elementary scientific education. No manual occupation is given; these are assumed to be acquired by the apprentice in the workshop. There are about 35 of these schools subsidised by the State. The programme of study includes the general notions of calculation, perspective, geometry, freehand drawing, designing ornaments and solids. The elements of physics and mechanics, hygiene, and industrial economy, special studies on chemistry, mining, metallurgy, and civil construction are given in different schools, according to the requirements of the locality. The term of this education is three years, but sometimes they extend to four years. On passing an examination the workman obtains a diploma or certificate, which, while certifying their skill, entitles them at the same time to an electoral vote. The professional schools are of two classes, for girls and boys. A part of the time is devoted to theoretical study, and a part to practical hand work. The female scholars choose the work they have the most aptitude for, which includes painting on porcelain, silk, fans and glass, the designing of lace work, the cutting and making up garments, sewing and embroidering, the manufacture of artificial flowers, and commercial pursuits.

A special diploma can be obtained in each class after three years' apprenticeship. The scholars pay a slight contribution, and there are some free scholarships. The State subsidises five of these schools, and the results obtained are very satisfactory. The professional schools for boys comprise the following:—Watch and clock work at Brussels; one for tailors in Brussels and one at Liege; a school for brewers at Ghent; weaving schools at Ghent, St. Nicholas, Courtrai, and Verviers; a typographical school for compositors and printers at Brussels; one for millers at Louvain; one for a knowledge of steam-engines at Namur; schools for the study of electricity at Brussels, Ghent, Charleroi, and Liege; schools for photography at Brussels and Ghent; one for working in wood and iron at Ghent.

In the two first named schools, for horology and tailors, payments alone are made, as the pupils remain at work all day; and the sons of brewers pay, but the workmen receive instruction free. In the professional schools there are 3,374 scholars, and in the industrial nearly 11,000. The total subsidy for industrial schools is about £21,000, and for the professional schools over £12,000. From one-third to one-half of the subsidy is paid by the State, the rest by the commune and province.

Applications for Letters Patent.

The following List of Patents has been compiled especially for *The Watchmaker, Jeweller and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; and 6, Lord Street, Liverpool.

9,885. George Scarlett, Liverpool, for "Improvements in or relating to electrical alarm clocks and indicators." Dated June 17, 1889.

9,930. Alexander Black, London, for "An improved fastening device for studs, solitaires, and other similar articles." Dated June 17, 1889.

9,969. Henry Wisseman and Gustav Schirmer, London, for "Improvements in time index markers." (Complete specification.) Dated June 17, 1889.

10,274. Herbert Cave, London, for "An improved process and apparatus for the amalgamation of gold and silver contained in their ores." Dated June 24, 1889.

10,279. Robert Edward Evenden, London, for "A new or improved apparatus for washing and separating gold and some other minerals and substances." (Complete specification.) Dated June 2[illegible], 1889.

10,296. Paul Neumark, Manchester, for "An improved stud or solitaire." Dated June 25 1889.

10,485. James Meeson, Sheffield, for "Improvements in the construction of artistic caskets, caddies, boxes, scuttles, or other receptacles to hold jewels and other commodities." Dated June 28, 1889.

10,645. Frederick Davis, London, for "Improvements in bronzing for gilding articles which are usually treated with gold leaf, and decorating." Dated July 1, 1889.

10,798. Samuel Thomas Rudge, Dursley, for "An improved means for affixing bows to keyless watches." Dated July 4, 1889.

11,032. J. Oulton and J. Edmondson, Bradford, for "Improvements in electric meters, parts of which improvements are applicable to clocks and timepieces." Dated July 9, 1889.

11,072. W. H. Read, London, for "The production of brooches and like ornaments from natural formations of the bones of the cod (morrhua vulgaris) and other fishes." (Complete specification.) Dated July 9, 1889.

11,088. W. W. Tambs, Camberwell, for "Fastening brooches, scarf-pins, lockets, gloves, solitaires, studs, earrings, sleeve links, bracelets, &c. 'The automatic combination brooch fastener.'" Dated July 10, 1889.

11,153. C. Cummins, Altrincham, for "The protection of gold and silver coins from deterioration by wear in circulation, by the addition to them of a protective rim of silver or copper as required, and continuous or otherwise as may be expedient." Dated July 11, 1889.

11,219. I. Morse, London, for "Improvements in spectacles." Dated July 12, 1889.

11,336. R. Bürk and Hugo Bürk, London, for "A workman's timekeeper or recording apparatus." Dated July 15, 1889.

11,340. W. Frost, London, for "Improvements in solitaires, studs and like articles." Dated July 15, 1889.

11,561. G. F. Redfern, a communication from G. W. Buxenstein, Germany, for "Improvements relating to repeating watches." Dated July 19, 1889.

11,602. E. H. White, London, for "An improved pipe key for locks, watches and other purposes." Dated July 20, 1889.

Recent American Patents.

Anti-Magnetic Watch. T. Mason	406,364
Attachment for Clocks. E. T. Chase	405,394
Button. Chas. A. Bryant	405,529
Clock Movement Holder. J. Harwood	405,258
Clock Pendulum. J. Warner.	404,997
Electric Alarm Clock. W. E. Hadlock	404,906
Electric Alarm Clock. B. Dubinski	405,206
Electric Self-winding Clock. J. H. Gerry	405,089
Finger Ring. L. L. Burdon	404,956
Fountain Pen. J. D. Bray	405,458
Fountain Pen. C. Stockmann	406,375
Hand-setting Mechanism for Watches. E. J. Rouse, Geneva, Switzerland, assignor to Vacheron & Constantin, Limited	406,307
Key for Timepieces. Martin Bock	405,004
Mounting for Earrings. V. Gentner	405,157
Split Chuck for Watchmakers' Lathes. F. Lautermilch	406,356
Thermometer. J. Hopson, junr.	406,139
Thimble. Chas. Horner	404,910
Watchmakers' Tool. A. F. Thompson	404,937

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller and Silversmith*, 7, St. Paul's Churchyard, E.C.

Gazette.

PARTNERSHIPS DISSOLVED.

Watson Bros., St. Michael's Alley, Cornhill, mining share dealers. J. W. Fryatt and Son. Brixton Road, pawnbrokers. W. Lacey and A. W. Cooke, City Road, gold mounters. Edward Hird and Sons, Ambleside, Westmoreland. watchmakers. William Robinson and Sons, Rugby, jewellers. R. E. North, Hatton Garden. diamond merchant. E. J. Reed, Melcombe. registered jeweller. E. D. Wilmot and Son, Birmingham, wholesale jewellers. Adams and Swan, Coventry. watchmakers. Hunt and Mitton, Birmingham and Cardiff, brass-founders. Montedonico, Ghelfi and Co., Great Sutton Street, Clerkenwell. grindstone merchants. John Brown and Sons, Newcastle Place. Clerkenwell Close, goldsmiths. Payne & Allen, Tunbridge Wells, jewellers. Mohrstadt & Co., Birmingham, button makers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

To surrender in London.—Lasalle, Henry, Covent Garden, theatrical jeweller.

To surrender in the Country.—Davies, Robert P. (trading as R. Davies and Son), Blaenau Festiniog, jeweller. Franks, Michael, Blaenavon, pawnbroker. Reed, Edmund John, Melcombe, registered jeweller. Baron, John Morris, Reading, jeweller. Taylor, Joseph, Sheffield, file manager.

Public Examinations.

In London.—R. E. North, Hatton Garden, diamond merchant, August 8, at 12. H. Lasalle, Bedfordbury, Covent Garden, theatrical jeweller.

In the Country.—E. J. Reed, Melcombe, registered jeweller, August 8, at 12.15. J. Oliver, Birmingham, letter cutter, August 7, at 2. J. M. Baron, Reading, jeweller, August 15, at 2.

Notices of Dividends.

A. Bishton (trading as Bishton and Fletcher), Birmingham, manufacturing jeweller, 5s., first, 120, Colmore Row, Birmingham. A. G. T. Winter, Southampton, pawnbroker, 4s., first and final, Portland Street, Southampton. O. Lewis, Liverpool, pawnbroker, 3s. 8¾d., first and final; trustee, G. Mahon, Liverpool. G. Thomas, Swansea, watchmaker, 2s. 6d., first and final, August 1st; Official Receiver, Swansea.

Scotch Sequestration.

J. Rhodes, file manufacturer, Glasgow.

The Deeds of Arrangement Act, 1887.

Hertford.

Clarke, Henry John, Windhill, Bishop's Stortford, watchmaker and jeweller. Trustee, Herbert Sworden, Bishop's Stortford, auctioneer and valuer. Unsecured Liabilities, £415 11s. 6d. Estimated Net Assets, £703. Creditors fully secured, £597. Deed of Composition dated July 15, 1889; filed July 20, 1889.

Montgomery.

Hodges, Charles Henry, 6, Bridge's Street, Newtown, jeweller. Trustee, A. S. Cooke, Wesley Street, Newtown, auctioneer and accountant, and another. Unsecured Liabilities, £335 14s. 1½d. Estimated Net Assets, £122 17s. 9d. Deed of Composition dated July 15, 1889; filed July 17, 1889.

Yorks.

Owen, Lewis Thomas, The Leeds Plate Works, 4, North Court and 68, Albert Grove, North Street, Leeds, electro-plate worker. Unsecured Liabilities, £146 17s. 9d. Estimated Net Assets, £57. By order on terms, 10s. in the £ by two equal instalments on September 6, 1889 and November 6, 1889, secured. Deed of Composition dated July 6, 1889; filed July 19, 1889.

BANKRUPTCY.

Re Alfred Robert Bray, watchmaker and jeweller, Herne Bay.—This debtor underwent his public examination last month in the Canterbury Bankruptcy Court. The statement of affairs showed liabilities amounting to £210 1s. 7d., and there was a deficiency of £135 3s. 4d. The debtor commenced business in April, 1888, with £50 worth of stock given him by his father and £5 capital. He subsequently established a branch at Sturry. Mr. John Carnegie, solicitor, of London, attending on behalf of Messrs. Loveridge & Sons, wholesale jewellers, endeavoured to show that the debtor had falsely explained his position to their representative. Attention was also called to the fact that the bankrupt had not disclosed a quantity of jewellery deposited with Messrs. Attenborough, pawnbroker, Strand, as security for a sum of £12. The examination was adjourned, the Registrar making an order for the bankrupt to file a cash account for the past twelve months.

Re Thomas Marsh and Robert Ledgerwood, Great Hampton Street, Birmingham, silversmiths and jewellers.—Application by Ledgerwood for his discharge. Mr. Hugo Young (instructed by Mr. Jaques) appeared for the bankrupt and Mr. Hasell for the trustee (Mr. J. H. Pearce). The Official Receiver (Mr. L. J. Sharp) reported that the receiving order was made in July, 1886. Marsh had absconded, and an order for his prosecution for certain malpractices had been made. The statement of affairs showed liabilities £1,917, and assets £851, which had not realised sufficient to pay preferential claims and costs. Marsh commenced business in 1870, and Ledgerwood joined him in 1885, providing £1,500 capital. Marsh had pawned the stock wholesale, but Ledgerwood swore that he did not know of the pledging till a couple of months before the petition. The pawnings showed gross commercial immorality, but whether they amounted to a fraud he (the Official Receiver) left the Court to decide. His Honour: There is no doubt they were fraudulent so far as Marsh was concerned. Mr. Hasell said the committee did not oppose the discharge, but hoped conditions would be imposed by the Court. The debtor was employed now as traveller by Messrs. Dunville & Co. at a salary of £400 a year and expenses: and he (Mr. Hasell) asked that an order might be made on the bankrupt to pay £100 a year out of his salary for the benefit of his creditors. Mr. Hugo Young said the bankrupt, who had been most unfortunate, was induced to invest his savings in Marsh's business through a balance-sheet which turned out to be fraudulent. Ledgerwood took no part in the pawnings, and remonstrated with Marsh when he discovered what was going on. He (Mr Young) opposed the attachment of any portion of the salary, and asked, if any condition was imposed, it should be one which allowed the bankrupt to pay when he could without compulsion. His Honour said the pawning of stock by jewellers in Birmingham was a crying evil and a gross fraud, and had the bankrupt been found guilty of it he should have refused the discharge. He could not regard the bankrupt's conduct as blameless, because he ought to have made enquiries into the dealings of Marsh, especially as he knew the firm was insolvent. He (the Judge) would grant the discharge subject to judgment being entered up against the bankrupt for £500; the motion for the attachment of the salary to stand over, with liberty to the trustee to apply to the Court if the bankrupt did not arrange satisfactorily for the payment of the debt.

Re Alfred Bishton, of Albion Street, Birmingham, manufacturing jeweller and factor, trading as Bishton and Fletcher. Application to void a fraudulent preference. Mr. Vachell (instructed by Mr. D. Davis) appeared for the trustee (Mr. E. M. Sharp), and Mr. Hugo Young (instructed by Mr. Pepper) for the respondent. It appeared that the bankrupt had in his employment a confidential Clerk named Crookes. Crookes had a private banking account, through which he had bill transactions for his master which Bishton did not wish his own bank to know of. Crookes thereby incurred liabilities, and to secure him, Bishton handed him pawn tickets relating to jewellery of the value of over £100. This transaction took place on the eve of Bishton's departure, and the trustee therefore challenged the legality of it. On behalf of the respondent it was submitted that Mr. Crookes pressed the bankrupt for security, and it was promised to him several times before the pawn tickets were ultimately given to him. His Honour considered that the trustee had not made out his case, and dismissed the application, with costs, the trustee to have his costs out of the estate.

Re R. E. North.—The first meeting of creditors was held at the Court of Bankruptcy on the 20th ult. The Debtor traded as a diamond merchant in Hatton Garden, and had also acted as managing director of the Diamond Cutting Company. His accounts showed liabilities to the amount of £11,339, and assets £1,961. Mr. L. Goldberg appeared for the creditors, and Mr. Rubinstein on behalf of the debtor. No proposal was made, and the proceedings resulted in bankruptcy, a trustee and committee of inspection being appointed.

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller and Silversmith, 7, *St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller and Silversmith.*

THE PARIS EXHIBITION.

Sir,—We observe with pleasure the kind references made in your July number by a special correspondent to the English exhibitors in the Horological Section of the above. Speaking for ourselves we regret we were not in the way when your correspondent passed through; and this may be explained by the fact that we are engaged in erecting three large turret clocks and bells on the main entrance (Porte Rapp), Eiffel Tower, and Machinery Hall respectively, to meet what has been felt to be a universal want, and this work has of necessity interfered with our attendant at our exhibit proper, and as for the other English firms, we know they have all spent a considerable time here and will do so again. We hope your correspondent did not call on a Sunday. We see you allude to Mr. Tripplin's exhibit and to the position he holds here as one of the jurors. We feel there is a debt of gratitude due to this gentleman, not only from all of us as exhibitors, but from the much larger field of the trade in general at home, for the manner in which he has "stood up" for us, through good and evil report, with his fellow jurors. From eight o'clock in the morning for weeks past Mr. Tripplin has been faithful to his vows, and the only question that has disturbed his otherwise serene disposition has been that we Englishmen should have justice meted out to us. Now that the onerous duties of juryman are practically over, we are emboldened to take stock of his countenance, and if the complacent smile, which has now found there a home, be any indication of the future, horologically speaking, things augur well for *la perfide Albion.* Of this, however, we at present know nothing. This much we will say, that Mr. Tripplin has done more for us than the whole British Section put together, and whatever be the upshot of his exertions, we have arranged to entertain him at home when the heat and burden of the Exhibition are over.

Yours very truly,

GILLETT & JOHNSTON.

Paris, *July* 9, 1889.

The Watchmaker, Jeweller & Silversmith.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

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MESSRS. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

NOTWITHSTANDING the general quietness prevailing at this season of the year, the last few weeks have been pregnant with excitement in many sections of the jewellery trade.

The affair of Dick and the Bromages has at length been brought to a conclusion and has culminated in sentences of fifteen and twelve months' hard labour, respectively. It is unnecessary to go into the details of the case here. These are set out in all their wealth of legal verbiage in the full report which will be found on another page in this issue.

It is to be assumed that the lawyers engaged in the prosecution knew what they were about when they drew up the indictments under the "divers" heads of these same, but it is not easy for the laity to understand why the offenders could not have been directly indicted for the perpetration of the fraud of which they have been convicted, instead of, or in addition to, "for having wickedly conspired and confederated together for the purpose of accomplishing it." But forensic procedure is unique; it is not to be criticised in comparison with ordinary business, or even common-sense methods; and peradventure some statute or other was in the way, or another could not be found, for the purpose of a more direct mode of procedure in this particular case.

Anyhow, it is satisfactory to all but the delinquents in question that the latter have been brought to book, and the result of the trial may act as a healthy deterrent in other quarters. While it is discouraging to observe the uncertainty with which the law relating to fraudulent bankruptcy is regarded by traders generally (in which connexion it is instructive to note that opinions were very much divided upon the issue of the present prosecution), it is somewhat reassuring to find, that when properly set in motion, it is not altogether a dead letter, to be set at defiance with impunity.

We have no hesitation in averring that an affair of the magnitude of, and of so flagrant a character as the Dick and Bromage case has as serious an effect on business, in its demoralising tendencies, as six months of serious trade depression.

Watchmakers and others who have been complaining during the past month or so of bad trade should recollect that at this season of the year business all over the country is always dull; it always has been so, and probably always will be. However averse to the frivolities of holiday-making either employer or workman may be, the most ascetic business man is but human after all, and it is natural for the tired town worker, of whatsoever avocation, to long for a glimpse of field or briny—the contemplative, for the quiet and retirement either affords, and the gregarious, for the change and excitement of congenial society. To adopt the pessimism of those who go so far as to believe that the present (or let us hope the now past) short period of dulness is a return to the depression which has characterised some recent former years, is absurd in the face of the generally improved trade throughout the land. As far as our observation goes we have no hesitation in saying that there is every prospect of a good autumn and winter season for most of, if not all, the trades we represent. In treating of the subject of the effect of the holidays on the jewellery trade, a contemporary observes that, strictly speaking, there should be no season in the jewellery trade, and, so far as regards the preparations necessary for the enterprising manufacturer and dealer to make in order to be able to meet coming demands, we are inclined to agree in the matter. Nevertheless, an interruption to active operations in the form of a well-earned holiday, if generally recognised, would do much to prevent grumbling on the part of those who want to crowd thirteen months into the year, and to work while the rest of the community are at play. It is perhaps somewhat of a truism to say that cheerfulness promotes business; anyhow, nothing is more conducive to the former good quality than a well-earned and well-spent period of relaxation.

We are not altogether in accord with our Sheffield correspondent, who thinks it is a pity that the American workmen visiting the town were not shown all the ins and outs of the workshops there. They came, as he says, admittedly to pick up any ideas which our manufactories might furnish them with, and, had our manufacturers been (to our mind) foolish enough to allow them to do so, the only inference to be drawn is that they intended to utilise whatever they might so glean to the detriment of (in competition with) our home producers. As to general hospitality, that is another thing altogether; and we have too good an idea of the good people of Sheffield to believe them lacking in it. But American production in the specialities which Sheffield makes its own is not to be despised; if we mistake not, the near future will show that we shall have to face a competition in this direction as we have to in others, and the first law in a trading community (as in other communities) is self-protection.

Sale of Stock-in-Trade.—Messrs. Hewer, Walkden & Co. are instructed to obtain tenders for the stock-in-trade, consisting of jewellery, &c., of the late Mr. W. Harrison, 11, Hill's Place, Oxford Street.

General Notes

The Master Cutler.—Mr. Samuel Gray Richardson, cutlery manufacturer, has been elected Master Cutler of Sheffield. The cutlers' feast will take place on the 5th inst.

Waterbury Watches.—The *European Mail* of August 9, in an industrial supplement, devotes a page to a eulogistic account of the Waterbury watches.

Dry Gold-Extracting.—The same journal contains a detailed and interesting article on the new gold-extracting processes, which we noticed some time back, invented by Mr. W. L. Card, and introduced to this country by Mr. Charles Wetzlar. The latter gentleman's offices are at 149, Upper Thames Street, where he is always ready to demonstrate the superiority of these machines to those interested in the subject.

Mining Exhibition.—It is now stated that the Gold-mining Exhibition which was to have been held at the Alexandra Palace this month, and which it has since been stated would be transferred to the Spanish Exhibition, will not be held at all.

What Firm?—Lady Guinness is said to have given an order for a diamond necklace to a well-known firm of jewellers, which will take several years to execute, owing to the present scarcity of stones of the first water. The design for the ornament is superb, and its cost will be about £25,000.

The Atherton Murder.—The adjourned inquest touching the death of Walter Davies, assistant to Mr. John Lowe, pawnbroker, 29, Market Place, Atherton, who was murdered on July 22, was held on July 31, when, after the conclusion of the evidence, the jury returned a verdict of Wilful Murder against some person or persons unknown.

Merchandise Marks.—The date of meeting of the Delegates of State parties to the Convention for the Protection of Industrial Property, 1883, which had been fixed for November 15 next, at Madrid, has now been altered to April 1, 1890. Important amendments of the Convention for the International Protection of Merchandise Marks will, among other things, be considered at the conference.

Caution.—Small plain imitation gold sets (brooch and earrings), with a diamond in the centre, are being offered, says the *Pawnbrokers' Gazette*. A slight band of gold round the edge, on examination, proved to be the only gold in them. Two pounds are asked, and the offerers have been very successful. The brooch is about the size of half-a-crown, and the sets are generally offered in a good case with a good maker's name on it.

A Meridian for the World.—Father Tondini, a learned Barnabite monk, who is well known in England, says the correspondent of the *Chronicle*, is now in Paris for the purpose of endeavouring to carry on his work of founding an international meridian which will make the time of day the same all over Europe. Jerusalem is the father's choice. A pamphlet is about to be published in three languages on the subject.

Burglaries.—The past month has been signalised by a series of some of the most daring burglaries that have been recorded for some time. Two of the most serious as regards the actual losses have been those at Accrington and Stourbridge. In the first, the victim were Messrs. Baxter, jewellers, of Abbey Street, in which property valued at £400 was stolen. In this case it is satisfactory to note that the thief was caught and has been sentenced to a term of ten years' imprisonment, which will prevent his operations in a similar direction for some time. The property was recovered.

In the second case, the premises of Miss Stringer, jeweller, of Stourbridge, were completely looted; property valued at £800 being made off with, with very little chance of its recovery. Defective police arrangements are very much blamed for the impunity of the thieves in this instance.

A New Pearl Fishery.—Great excitement prevails at Albany, in Wisconsin, a village of about 1,000 inhabitants, situated on the Sugar river, over the finding of pearls. They are found in clam shells, between the membrane and shell. They are of all sizes, from a pin's head to a large-sized pea, and of all shades. Some have been sold for as high as £20, and £25 has been refused for others. Shipments to New York and the East have netted handsome returns. A shipment estimated to be worth £400 was made to Chicago. The excitement is so great that men, women and children are raking the river in search of clams.

Sale of Ivory on the Continent.—The first public sale of ivory imported direct from the Congo took place last month in the Antwerp Exchange. The quantity offered amounted to 1,139 tusks, weighing altogether about 33,200 lbs., and the price obtained ranged from 5s. 6d. to 11s. 4d. per lb., which, it is said there, gives an average larger than that realised at recent public sales of ivory in Liverpool and London. This event caused considerable interest in Antwerp, and the sale was attended by a large number of purchasers from England, France, Germany, and Holland. It was so successful that it is stated other African produce will be offered shortly.

A dear Trinket.—The Commissioner of Customs has, says the *Melbourne Argus*, had under consideration the case of an attempt to evade payment of duty by a well-known Melbourne brewer, Mr. R. K. Montgomerie. The latter, whilst on a recent visit to Sydney, purchased a diamond necklace, valued at £750, and brought it into the colony without paying duty on it. Information of the circumstance was obtained by Detective Christie, and the result of his investigations concerning the affair was that Mr. Montgomerie expressed his willingness to have the case dealt with by the Commissioner of Customs. The Commissioner ordered the amount of duty to which the necklace was liable, £154, to be paid, and also imposed a fine equal to double that amount, £308. The fine and amount of duty have been paid, and the necklace returned to the owner.

Pawnbrokers' Signs.—An Excise Official in Sheffield has just discovered that when a pawnbroker ceases to take in pledges, he must remove the time-honoured sign from outside his premises. This at least was the instruction he gave to a member of the trade who renewed his plate license, but no longer required the other. After this we shall hear that when a pawnbroker's license is taken out, the official, in handing it over, will direct the recipient to at once put up the golden insignia associated by custom with his business. For the information of the Yorkshire officer, the *Pawnbrokers' Gazette* says that it is not unusual, particularly in seaport towns, to see the three balls suspended long after the trade which they suggest has ceased to be carried on, and the editor knows of old-established pawnbrokers' shops which have never displayed the three bezants.

Paris Fashions.—Rubies are very much in demand just now among Paris fashionables. One sees many of them set with diamonds, and pearls are also used very artistically. In one of the largest jewellery establishments a correspondent saw some handsome inkstands, paper weights, and jewel boxes, made out of Mexican onyx. The cameo is being revived, and cuff buttons and scarf pins mounted with them in gold wire settings have a pleasing effect. Silver earrings, silver combs and silver bracelets are seen everywhere. The ball bracelet and old silver, oxidised or plain band, are much worn. A diamond tiara set in silver attracts much attention in an up town window. In canes a big stick, with heavy hollow silver handle, is popular. The handle unscrews, and being fitted with a spring door, valuables can be placed inside the handle. The Frenchmen carries a small rapier in his cane.

The Merchandise Marks Act.—It was elicited from the Baron H. de Worms, in the House of Commons last month, that laws similar to the Merchandise Marks Act were in force in the following colonies:—Canada, Newfoundland, the Cape of Good Hope, Natal, Western Australia, Jamaica, British Guiana, British Honduras, Trinidad and Tobago, Grenada, St. Vincent, St. Lucia, the Leeward Islands, the Falkland Islands, St. Helena, Sierra Leone, the Gambia, the Gold Coast, Lagos, Gibraltar, Ceylon, Mauritius, and the Straits Settlements. The Governments of the following colonies had promised to introduce similar legislation, viz.:—Victoria, Queensland, South Australia, Tasmania, New Zealand, Bahamas, Barbadoes, Malta, and Hong Kong. The Secretary of State had taken the necessary steps to secure uniformity of legislation in Crown colonies, and he trusted that in those colonies in which the Crown had no control over legislation, uniformity would shortly be established.

Swami Jewellery.—The Parsee merchant, Mr. Framjee Pestonjee Bhumgara, a letter to whom from the Duke of Fife appeared recently in the papers, has been engaged in an attempt to open up a market in this country for the beautiful "swami" jewellery and other ornamental work in carved metals of Southern India. Some time ago he visited England for the purpose of familiarising himself with the requirements of Western taste, and on that occasion he succeeded in obtaining an introduction to the Queen, who received him at Windsor, and expressed herself greatly pleased with the work, and appointed Mr. Framjee a jeweller to the court. This naturally made the Empress very popular with the swami workers in Southern India, and when they heard of the coming marriage of Princess Louise of Wales, "the trade"—probably with a wise eye to business as well as loyalty—turned out a magnificent casket as a wedding present. The casket figured conspicuously in the show of presents at Marlborough House.

Jewel Robbery. — Two bracelets, value £480, form no ordinary temptation for the enterprising thief. A Vigo Street, Sheffield, jeweller had two of these valuable trinkets in his shop on July 24, when young Mr. Edward Smith, aged 24, called in and asked to see some diamond bracelets. Having got two of the most expensive in his hand, he made a bolt for the door, and ran for it. The jeweller, however, would appear to have been a man well up to the risks of his trade, for the assistant who served Mr. Smith was fleet of foot. He gave chase to the thief, and after skilfully evading a confederate whom the diamond-lover had placed near the shop door to trip up pursuers, kept his hare in sight until a constable effected a capture. The bracelets were found upon the prisoner, and the £480 worth of diamonds brought back to the shop. The prisoner is now in custody awaiting the result of the police inquiry into his previous career. The jeweller's assistant deserves, the Sheffield papers think, to see a part of that £480 booty.

Anniversary Dinner.—Messrs. Baume and Co.'s Coventry employés had their first annual outing last month. The dinner took place at the Greswolde Arms Hotel, Knowle, and the programme included a most enjoyable drive to Kenilworth (where the castle and grounds were visited) and Warwick. The party, which was supplemented by a London contingent, numbered 50. At the dinner, Mr. Arthur Baume presided; and, after the usual loyal toasts and preliminaries, Mr. Weston, the manager of Messrs. Baumes' Coventry watch factory, in proposing the health of the firm, felicitously eulogised the principals, and in the course of his remarks stated that the firm laid down the law in a very emphatic manner that the Merchandise Marks Act should be strictly adhered to. Mr. Baume responded; he expressed his complete satisfaction at the progress made by the Coventry brance, under the able management of Mr. Weston, and said he saw no reason why their connexion with the English watch trade and with Coventry should be severed for many years, if indeed it ever was at all.

The Working Men's College.—Sir John Lubbock (Principal) and the Vice-Principal of the Working Men's College, Great Ormond Street, W.C., have issued an appeal for further support in the shape of donations and subscriptions. The circular sets forth that the lowness of the fees charged for instruction prevents the institution from being self-supporting, and that there have been recurring deficits of £50 a year and upwards, which seriously cripple its work, and are a source of constant anxiety to its Council. At the present time 800 students are being educated there at a cost of about 17s. a head, and the Council are unwilling to believe that so useful an institution, founded by one with a name so honoured as that of Frederick Denison Maurice, and carried on at a moderate expense for the last 35 years, would be allowed to languish for want of means, if its real claims to support were before the public, and when, too, a very moderate addition to its income would place it financially in a satisfactory position. A report which accompanies the memorial gives the history of the college during the last nine years and its present position. Donations may, if desired, be devoted to any of the special funds of the college, instead of to current expenditure. Mr. H. R. Jennings is the Secretary.

The Diamond Market.—Neither the consignments from the fields nor the number of buyers in the *London* market were large during the past month. The high prices were maintained, causing limited sales. The *Paris* trade was a repetition of the preceding month, foreigners being the principal buyers.

United States advices concur in favourable views of prospective good trade.

The Dutchmen are, as usual, grumbling at the present prices of *rough*, but from all appearances there does not seem much chance of a fall, especially in view of the several combinations which exist for the purpose of maintaining prices.

Metals.—*Silver.*—The latest quotations are, Bars 42⅜d. and Mexican dollars 41⅝d. per oz. respectively. The *Copper* market has been easier on the spot, and business has been done during the month at £43 5s. to £43 cash, and at £42 10s. to £42 12s. 6d., three months. Prices closed in the middle of the month at £43 10s. and at £42 10s. respectively. English, tough, £47 to £48; best selected, £48 to £48 10s; strong sheets, £55 to £56; India sheets, £52; yellow metal sheets, 5¼d. *Tin* has been in fair demand at advanced prices—namely, at £91 to £90 17s. 6d. cash, and at £91 15s. to £91 10s., three months, with further sellers at the latter price. English ingots are £94. *Spelter*, ordinary brands, £21 to £21 2s. 6d.; special, £21 2s. 6d. to £21 7s. 6d. *Lead*, Spanish soft, £12 15s.; English ordinary brands, £12 17s. 6d. to £13. Importers of *Quicksilver* have maintained their price at £9 15s., whilst second-hand holders have made up to £9 10s. *Iron.*—Manufactured is strong at the late advance.

BIRMINGHAM NEWS

From Our Correspondent.

The month of holidays and cheap railway trips, the great harvest-time of the excursion agents and lodging-house keepers, when the weary artisan and clerk, enticed by the flaming posters of the queen of watering-places (of which there are now about a dozen) takes himself and family to the supposed haven of rest, only to find that all the world and his wife and all the children have done the same thing at the same time: and after sleeping in a bathing machine because there was no room in any other covered receptacle in the place, to find that having gone out for the benefit of his health that he has come back without it; this month of jollification and bad trade has come to an end; and now, perhaps, people will once more get to work, and there will be some business done worth mentioning, for certainly the totals of the month of August are very much below par. There is, consequently, an outcry of bad trade; and, as one or two instances of workmen being put upon "short time" have cropped up, I presume the complaints are not without foundation. Indeed, the outcry was pretty general at the end of the month, especially amongst the cheap classes of jewellery and silversmiths' work.

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In vain has the energetic traveller worked the round of the factors' warehouses, followed by his weary porter with the hand-cart heavily laden with stock of the newest design and at the lowest possible price: in vain has he importuned for "appointments," for the buyers were all at the seaside (with their coat collars up and umbrellas spread), where they had gone for a little relaxation and to shake off the cares attached to the race for wealth, which is a pretty stiff handicap now-a-days. Well, we hope September will bring golden harvests in every sense, and that the voice of the "turtle may be heard in the land," if he has not been made into soup for the alderman's banquet, or his shell into combs, eye-glasses, etc., by the enterprising Birmingham manufacturer.

* * *

The principal gossip of the month has been upon the Dick and Bromage case; and, after expectation had almost grown into exultation, and the trade was about to go into ecstasies of joy over the fact that the "rascals had got their deserts," it was suddenly thrown into an utter state of dejection and the deepest mourning by finding that the "punishment did not fit the crime;" and although fifteen months' hard labour is the hardest performance that has been done by the aforesaid enterprising gentlemen up till now, it has not given the satisfaction that the trade looked for and hoped for: still we all feel that the commercial atmosphere will be purer for the next fifteen months, and that the example will prove to any intending gentry of the same kidney that it is an awkward business to transfer your neighbour's property to the nearest pawnshop and then get a lawyer to prove—or try to prove—that it is legitimate trading.

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In talking with one of our silversmiths about the scarcity of original designs in that branch of the trade here, I was surprised to hear him express himself as follows: "Oh, it does not do to bring out entirely new ideas in our line; buyers think you are too self-conceited if you try to push your own ideas before those that are already accepted, such as good American and German patterns." I hope this is not at all a general opinion, as it is not like Birmingham to take a back seat in this way, and I strongly recommend all young manufacturers not to be guided by such nonsense. We must keep up to our town motto, "Forward," and be in the van with new designs, or we shall certainly be very heavily handicapped in all markets. Although I hear some complaints that good artistic workmen are scarce of late, especially among embossers of *repoussé* work, yet I find that Birmingham can hold her own among high-class silver work, as several expensive Art Caskets in both gold and silver have been made of late by one of our rising art workers, for which other towns have had the credit, the exact location of production having been sunk for that of the shopkeeper who secured the order.

* * *

I understand that the new combination key and swivel, manufactured by Messrs Parkes and Son, Bath Street, Birmingham, is in great demand, and indeed it is not surprising. The thing recommends itself at once as being both practical and handy, and the price being within reach of the million it has without doubt a great future before it.

The premises in Upper Hockley Street, recently vacated by Mr. E. Scott, have been taken by Mr. Mathews, musical instrument maker, whose speciality (judging by the view of his windows) appears to be banjos.

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The latest novelties in silver salt cellars are, I understand, to be small artistic models of various articles in use, such as hats inverted and the brim decorated, a kettle-drum artistically ornamented, and similar arrangements of articles that are capable of containing the salt. They are to be made small so that a number of them can be placed on the table at once. In addition to this, the small silver flower stands for holding one specially nice flower or some rare specimens are finding favour among buyers.

SHEFFIELD NOTES

From Our Correspondent.

Why don't the Sheffield silversmiths get excited, and go on the stump, orate, pass resolutions and behave like idiots in general, and party politicians in particular? This, in effect, if not in words, is the agonising appeal made by one of the local newspapers to the manufacturers. And all because noble lords in "another place" have had a debate—or rather a conversation—upon the plate duties and compulsory Hall-marking. It seems to be assumed that because of this the duties will be taken off forthwith, and that the abolition of compulsory hall-marking must follow as a necessary consequence. Well, it may be so, but Sheffield silversmiths decline to be enthusiastic nevertheless. It is, however, one of the things which "no fellah can understand" that the newspaper which insists that everything else should be marked with its quality as well as the place of its origin should make an exception in the case of plated goods, and would virtually allow that to be sold for silver which would in reality not be silver.

It is stated that Mr. W. P. Salt, secretary to Joseph Rodgers and Sons, Limited, by the invitation of the Mayor of Leeds, attended the festivities in connection with the visit of the Shah to that town. It is added that after the luncheon Mr. Salt had an interview with the Grand Vizier and received on behalf of his Company the written appointment of "Cutlers to the Shah." This reads like a "goak," but it isn't. It is simply one of the subtilties of indirect advertising. The other day I noticed on the back of a baker's van an announcement intituling the proprietor "Bread contractor to his Imperial Majesty the Shah." I don't know whether this was by written appointment or whether one of the dusky potentate's suite had simply bought a bun at the baker's "establishment." Anyhow this sort of thing sells in trade, as anyone with any experience knows. In these days of keen competition one must advertise in some shape or other.

The manufacturers of cheap "rubbish" have been rather severely criticised lately on account of the alleged injury which they are inflicting on the good name of the town and consequently on its commercial well being. They are accused of making one class of goods for the home market, and another, but vastly inferior sort for certain foreign markets. Hitherto the people who talk in this fashion have had it all their own way, but now their dictum is boldly challenged by a manufacturer who has evidently more than a theoretical knowledge of the practice declaimed against. This gentleman, who successfully conceals his identity behind an assumed name, lays down the proposition to start with that manufacturers may be safely trusted to know what classes of goods will sell in certain markets. He then asserts that inferior goods are also low priced goods, and that if Sheffield does not send such goods to certain markets Solingen will. As a matter of choice no maker would care to produce low priced rubbish if he could sell a decent article at a remunerative price. As to the ruinous consequences which are supposed to result from carrying on business on this principle, it is pointed out that there are firms who have done so for more than 50 years and are still flourishing. This reasoning, of course, won't convince everybody, but all the same it is only fair that manufacturers of "cheap rubbish" should be allowed to state their own case.

The usual annual meeting of the Cutlers' Company for the purpose of electing the Master Cutler and of constituting the company for the ensuing year has just been held. As a result Mr. Samuel Gray Richardson, of the firm of Southern and Richardson, was unanimously elected Master Cutler. The Cutlers' Feast will be given on the first Thursday in September.

The movement in favour of the erection of new Municipal Buildings has taken a definite shape. The sub-committee appointed by the improvement committee has reported in favour of advertising for plans for the new offices, and this it has been decided to do. As this involves the expenditure of an amount of money which everybody admits to be at present an unknown quantity, it clearly shows the spirit of hopefulness which prevails. There is, of course, the usual talk about the pockets of the ratepayers, but this is confined to so few that we must conclude that the general community is fairly prosperous.

The preamble of the Canal Bill has been proved and the ultimate success of the measure is thus practically assured. This news is of profound import to the heavy trades of the town, but it is of more or less interest to all its industries. With a waterway to the Humber the future development of the town is secured. It is reasonable to hope that there will now be no further removals of businesses to the coast—a process which at one time threatened to shrink Sheffield to its proportions of 40 years ago.

The 30 or 40 American workmen who visited Sheffield the other day cannot have been impressed with the idea of our hospitality. This is a pity, as we plume ourselves on being a hospitable community. These visitors, however, have excited more than suspicion from the very first. They came admittedly to visit our workshops, and pick up any ideas which might be useful to them at home. Now Sheffield has come to the conclusion, rightly or wrongly, that too much of this sort of thing has been permitted in the past. As a consequence the majority of the firms in the town decided not to admit the American workmen. Several notable exceptions to this rule, however, occurred, among them being Joseph Rodgers & Sons, Limited, who not only threw open their showrooms, but provided competent guides to conduct their visitors through the workshops, concealing no process of manufacture whatever. The Americans expressed themselves as being delighted with what they saw, and were evidently pleased with the warmth of their reception. They had intended visiting some of the slums under the impression that the working classes of Sheffield live there, but were prevented by the state of the weather.

It seems as though we were at last within measureable distance of having the valuable collection of art treasures, lent by Mr. Ruskin to the town, placed within reach of the people whom it was intended to benefit. At the back of the remote suburb of Walkley it was practically useless to the vast majority of the toilers whose lives it was meant to sweeten. All this, however, is to be changed. The idea now is to have the small but priceless collection of paintings, missals and precious stones housed in the building within the new Meersbrook Park. This being on the tramway route will place it within easy access from all parts of the town. A preliminary meeting to arrange the details of the new scheme was held at the Town Clerk's Office, and the matter will now come before the Town Council in order to be formally adopted. It will then only require Mr. Ruskin's sanction to become an accomplished fact, and as the details of the scheme have been arranged in conformity with his ideas this is not likely to be withheld.

The Annual Exhibition of the Sheffield Society of Artists has been opened at the School of Art, and is likely to be as successful as usual. The ranks of the people who paint and model are being continually recruited from among the numerous art workmen employed in the silver and other trades of the town, nevertheless we labour under a depressing sense of the fact that our best men leave us and go to London as soon as they can do anything really worth looking at. In spite of that, however, those who remain are doing a good work. They form a society, slightly bohemian it is true, but permeated by a genuine love of art, which is a distinct gain to our otherwise prosaic town.

Trade in the silver and electro-plate trades is in a satisfactory condition. This is understood to be the dead season, but, as the manager of one of the largest limited companies in the town said to me the other day, our dead season this year is better than our busiest season five years ago. As a matter of fact, managers have as many orders on their books as they can comfortably execute. There is no push, it is true, but on the other hand no man who is willing to work need go about with his hands in his pockets.

Midland Jottings.

By W. K. P.

FORTUNATELY there is no new scandal to introduce this month, and the old ones are now disposed of, and it would seem as though "Midland Jottings" would come but poorly off! Not so, however, notwithstanding the fact that it is now the "quiet season" in the jewellery trade, and many people are away disporting themselves in the portions of ocean to be found, patronising such cities by the sea as Llandudno, Bournemouth, or Weston-Super-Mare. Many there are who have braved all and gone to Paris. Those who return from thence say they have enjoyed themselves. *Très bien!* I hope so!

There is still a very considerable amount of uncertainty regarding the new styles and which of them will shortly become prevalent. No one of the many attempts at introducing a new thing has been successful in creating a "rage" for it. It is one of these "rages" which is urgently required to make things look "bright and bowery" around Frederick Street way. There are lots of pretty novelties issuing from the workshops of Northampton Street and Warstone Lane, but, pretty as they are, they don't become the universal "catch-on" that they should, in order to satisfy the demands of their producers. Women are fickle we all know, and they have been so pampered in their jewellery among other things that they are less stable and more exacting in this direction than in any other.

There are certain tendencies, however, which indicate a slightly more stable state of things. The thin wire bangle and the narrow bracelet are yielding a little to wider ones, and some fine things of an inch in width are being worn in Paris. Some of these are plain, while many of them are of all kinds of fancy designs, utterly disregarding any one "style" however. There are also some beautiful things in enamelled work, weighing from one-and-a-half to two ounces, which are enamelled in exquisite fashion inside as well as outside. There are also some charming brooches, light and graceful, chiefly of the May-blossom type, enamelled in colours and associated with a diamond or two. The tendency towards the Empire style, of which I spoke in some of my recent "jottings," is become a little more pronounced, and Queen Anne is becoming disregarded even more now in favour of Louis Quatorze, Louis Quinze and Louis Seize. This tendency has been taken up by Messrs. T. and J. Bragg, among others, who are developing it and producing some pretty work in this style. There can be no doubt about it being very artistic, and I hope to see it come largely into fashion.

There is some very nice silver jewellery now being sold in Paris, and just introduced in London, which will, in all probability, take the place of gold for a time. It has a beautiful grey surface, which is not at all like silver as we generally suppose silver to be. It is quite the rage in Paris, but we question if it will become so here, as English people when they have silver jewellery like to see it look like silver, and until the whiteness of silver changes to grey, it is likely that the British mind will have none of the new thing so fashionable in the French capital.

Messrs. Bragg are, of course, busy as usual on presentation work for Institutions and Corporations. A great deal of this kind of work though is ordered from other places than Birmingham and is not generally supposed to hail from that city. It does not bear the name of a Birmingham firm, but I suppose this doesn't much matter, for anyone particularly interested in the subject would know its origin and in many cases the very firm by whom it was produced. Everyone in the trade, at all events, would know who made any individual casket, key or chain, and after all it is this which is the important matter.

The silversmiths are not in a very despairing condition, though on the other hand they are not working day and night to complete their orders. There is a fair amount of work about and trade is pretty brisk. New patterns are being produced and old ones dying out. I heard the other day of a tray which was produced in Paris which took two years to engrave. Nowhere else would such a phenomenon occur, and it is only in Paris probably that such an article would ever be sold. The shell and scroll work is still very apparent in all silversmiths' work, and the extreme delicacy with which this kind of work is treated is its salvation, as it is quite unmeaning in itself. Tea and coffee sets of considerable interest are being produced in this pattern.

These designs are debased, and as I have said, unmeaning. The scrolls have no connection with each other and are simply joined up by loops. I shall not be at all sorry to see this kind of work disappear altogether and a better class of work come into vogue. There is an evident activity in special work, and the artist is now becoming more and more important, so that the signs are propitious. Both in silver and gold work there is displayed an activity which looks well for the future. When a special thing is required there is no beating about the bush, but the artist at once sets to work, produces his design and sends it away, in many cases, by return of post. There is no hurry about it however, but a system which produces good results.

I went over the show of Mr. C. J. Adie, of Warstone Lane, Birmingham, the other day, and was very pleased to find how many really nice new designs there are in the electro-plate branch. I noticed only one or two sets of Queen Anne pattern, and on enquiry, find that in this branch of trade, as well as in the jewellery, this pattern—once the rage—is now going the way of all flesh. The newest things are the "tapestry ware," mounted in electro-plate. This is now being applied to all classes of goods.

It is far more effective than the ordinary china and admits of even more variety than that very varied article. I saw some very charming specimens in tapestry ware of salad bowls and ladles, butter and marmalade dishes, biscuit jars and cruets. This ware will very well accord with the universal influx of artistic cretonnes which one may see in every upholsterer's shop to-day. They are very different to the old cretonnes, and are of infinite variety. A room upholstered in this material looks most charming, and if the table is supplied with the tapestry ware, the effect is greatly enhanced. The growing taste for really artistic work will serve to make the tapestry ware much sought after.

China is not to be sneezed at, however, for Mr. Adie is producing some exceedingly neat five o'clock tea sets in china on an electro-plate mounted oak tray, which are very effective. A beautiful cream and gold set took my fancy immensely. Glass, too, is being used, and some specimens of claret jugs in iced and frosted glass were awfully nice. A speciality at 156, Warstone Lane is the new pattern egg cruet with an improved arrangement for the spoons. We all know—for tempers are short in the morning—how a day may be spoiled by the wretched business at breakfast-time of getting a spoon wherewith to attack the matutinal hen's egg.

Other "special" things are the "combination cruets," which are made in various forms or combinations, such as pickle and breakfast, toast and butter, toast, butter and breakfast. All these are convenient and additions to the luxuriousness of the modern home. There are some jolly things in inkstands for athletic and other prizes, which may be had as desired for various sports as boating, tennis, cricket, football, &c. A great many little novelties which would make a long list if enumerated, make a very pretty show in the cases. Letter balances and flower stands, wheel-barrow and nutmeg-shaped salts are among the number.

The older branch of Mr. Adie's business is the combination of metal and wood for the production of gongs in oak and brass; china and brass candlesticks; wood and electro-plated card racks and inkpots in polished oak and brass. One of the finest things I saw was a combination stationery case and post and delivery box for a private office. This was extremely handsome and was fitted with the "grill" piercing which Mr. Adie introduced and which he has adapted for many purposes, including some of the wood and metal racks for post and letters, in which the brass or electro-plate portions consist of the "grill" piercing.

This piercing is a particular form of work for the manufacturer of made-up electro-plated or brass goods. In many instances the maker obtains his blanks or his piercings from the "stamper and piercer," which is quite a distinct branch of the trade. It is obvious, therefore, that Mr. Adie, having his own dies and tools, can produce his own independent designs, and this he does with much success. I saw a beautiful electro-plated inkstand which was first stamped out of a die, then pierced round its edges, placed once more in the die to planish it and then finished, the result being very effective. Mr. Adie has this advantage over some of his manufacturing brothers.

Messrs. N. C. Reading and Co., makers of all kinds of chain jewellery and Messrs. Henry Allday and Son, manufacturers of gold chains, report business fairly brisk. Some of the small makers, however, are in a very bad way. Messrs. Swinden and Sons are well employed and have taken several orders at their stand in Bingley Hall, which is one of the nicest in the Exhibition. There are several firms, whose names are not unknown to the readers of this journal, who have very nice exhibits, but to these I refer more in detail in another column.

The London Watchmakers' Trade Association.

At the Martyrs' Memorial Schools, St. John Street Road, on the 14th ult., the quarterly meeting of the above Association was held, Mr. S. A. Brooks in the chair. There was a fairly numerous attendance, and matters concerning the trade were freely discussed.

Mr. J. T. Newman (the late secretary) said he wrote to the Board of Trade, enclosing the resolution of that Association in favour of appointing inspectors for the enforcement of the provisions of the Merchandise Marks Act (which resolution had also been endorsed by the Associated Chambers of Commerce), and had received a letter of acknowledgment thereof from Mr. Courtenay Boyle.

The Chairman said he might here remark that, since this letter was received, the Government had resolved not to appoint inspectors; therefore, unless the members of that Association subscribed liberally to the funds so as to have inspectors of their own, the dishonest traders would go on as before. Why the Government did not appoint the inspectors he (the speaker) could not see, because they had officers to look after the adulteration of milk and coffee. Why they should not have inspectors to prosecute in heavier matters he could not understand. It was quite certain, however, that, unless the watchmakers combined and subscribed, they would not be able to go on with the prosecution of fraudulent traders which they had so well begun.

Mr. Newman (continuing) said the subscriptions to the Association were better this year than last, the amount for the present year being £33 15s. 6d., as against £29 5s. 3d. in the corresponding period of last. This he attributed to the appointment of a collector. But there was this important fact to be considered, viz., that whilst the total subscriptions to the Association since their commencement had been £101, the cost of prosecutions had been £98 5s. They could not, however, carry on prosecutions unless they had money. They must have witnesses, and in sufficient quantity so as to meet any expert evidence brought forward by the other side. And they could not expect expert men in the trade to go and waste their time at the police-courts without being paid. Each prosecution they had cost them £20, taking it all round, and they had had many inquiries from the trade as to the legal aspects of the case which they had to get answered. Since last January they had had seven prosecutions, and, of course, if the magistrates had allowed them £20 costs, instead of 20s. or 40s., they would have been all right. But if the trade as a body came up with their subscriptions, they might yet do some good work. If members exerted themselves a little, and impressed upon others the necessity for sustaining the institution, they would be in a far better position. He, personally, would have been delighted if the Government had appointed inspectors.

This matter then dropped.

The Chairman said the last meeting recommended that Earl Compton, M.P., be added to the list of vice-presidents. Also Mr. J. T. Newman, their late secretary, in recognition of his zeal in the cause of the Association.

Mr. Andrews proposed this, and Mr. Peavot seconded.

It was unanimously adopted; and Mr. Newman returned thanks, adding that he took honour as proof that, whatever differences might have existed, they were now harmonious.

The Chairman said it might interest his hearers to know that since they last met he had been to Coventry, where he found trade very busy. What had helped the watch trade very much was the bicycle trade, which had absorbed what might be termed the rougher element of the trade. But these, it was said, made the best bicycle makers, and the latter, he might add, were working night and day to execute their orders. This taking of the rough unskilled labour from the watch trade made it better, of course, for the skilled men. He met with a very hearty reception from friends down there in consequence of the action of the London Watchmakers' Trade Association. The Coventry people were very much delighted with it, and gave that Association credit for reviving the trade of Coventry. There was a gradual movement in business for the better, but what was wanted for London was capital. They had the workmen and the facilities for producing low-priced work the same as Coventry or Birmingham, but the capital for starting the factories was needed. If capitalists only knew the gold mine which was before them in this respect, the London watch trade would soon be in a condition of considerable prosperity. There was a demand for London watches, and, if they could be produced cheaper, the demand would be still greater.

Mr. Moore moved :—"That the meeting consider as to the advisability of having a London mark for London-made watches."

Mr. Montague seconded.

Mr. Sanders thought this would not be practical, but denied the insinuation that there was antagonism between the case and the movement makers.

Mr. Macfarlane thought every watch—case and movement—should bear the mark of its place of origin, whether Prescot, Coventry, Birmingham, or London. At present the reputation and the head of the London watchmaker were being taken by the country makers.

Mr. Whitmee, while agreeing with the resolution, because he thought it would bring them in better touch with the London manufacturers, advised caution in the matter, and thought that before they passed such a resolution they should have a conference with the manufacturers and get their opinion on it. He moved an amendment accordingly.

Mr. Moore was afraid the manufacturers, who got their movements from Coventry and other places because of cheapness, would not consent to it.

Mr. Milligan seconded the amendment.

The Chairman could not help thinking there was a little antagonism between the case and movement makers, but he did not see why this should be. The case-makers had got what he called their "bit" by the stipulations of the Merchandise Marks Act ; but not so the movement-makers, because Coventry works might be put into a London case and the whole called a London watch. They should try to help each other.

Mr. Andrews said the case-makers were in sympathy with the watchmakers.

Mr. Moore urged that there would be no harm in passing the resolution, because it would be optional if they used the mark. Of course it would only be used with the sanction of the Association, and under certain restrictions, but it would ensure a London-made watch to anyone wanting one.

Mr. Newman also denied any differences between watchmakers and case-makers, and said everybody would be glad to see a London-made watch throughout, but they must not be too narrow-minded over the matter.

Ultimately the amendment was withdrawn, it being understood that the matter be referred to committee to be thrashed out by them, with power to call such evidence as they may deem desirable.

Mr. Jones raised a question as to the abolition of the declaration which was at first stated to be requisite in regard to watches. There were still, he said, foreign movements being cased in England and sold as English watches, and he would like that Association to ask the Board of Trade why the declaration had been done away with. He thought it was the duty of the Association to make such inquiry.

Mr. Newman said there was nothing to be gained by such inquiry, because the Merchandise Marks Act was an existent fact, and there was no clause to the effect stated in it. There was nothing in the Blue book about it.

Mr. Jones was confident that the declaration was proposed ; and

Mr. Macfarlane was averse to saying that, because a matter had become law, it could not be altered. Why, some of the best emendations were the outcome of questions such as these in and out of the House. He would like to know where the pressure came from which led to the withdrawal of the essential declaration as to the contents of the London-made hall-marked watchcase.

After the usual vote of thanks to the Chairman, the meeting closed.

Workshop Memoranda.

Solder for use at Low Temperature.—According to *La Metallurgie*, an alloy, useful when metals are to be soldered together at a low temperature, can be made as follows : Copper in a fine state of division is obtained by precipitation with zinc from a solution of sulphate of copper. From twenty to thirty parts of this, according to the hardness required, are mixed in a cast iron or porcelain mortar with concentrated sulphuric acid, to which is finally added several parts of mercury, and the whole triturated with the pestle. The amalgam thus formed is thoroughly washed with water to remove the sulphuric acid, after which it is left untouched for from ten to twelve hours, at the end of which it is hard enough to scratch lead. To use the alloy for soldering it is warmed till it has about the consistency of wax, and in this state it is applied to the joint, to which it adheres very firmly on cooling.

Method for Removing Tight Finger Rings.—Use the finest silk or thread consistent with strength—ordinary housewife thread is strong enough. Pass the end between the finger and the ring, keeping the spool or unlimited end at the side next the finger-tip ; then wind downward toward the tip of the finger for about a quarter of an inch ; then wind off from above by the short end about half this amount. Proceed alternately winding on and on, always leaving about one-eighth of an inch in breadth wound beneath the ring. When the knuckle is passed, the ring comes off easily. Oil or soap the thread well, and push up the ring before commencing to wind. This method, it is believed, will remove any ring.

Sir John Bennett's Furniture Sold.—By order of the sheriff, the contents of Glen Druid, Chislehurst, the residence of Sir John Bennett, were submitted to auction on the 22nd ult. With the exception of the books, the whole of which were claimed, the entire contents of the mansion were put under the hammer. The catalogue contained upwards of 450 lots, and they were all crowded into one day's sale, so that the proceedings were not concluded until between seven and eight. The attendance was remarkable from the fact that it included most of the leading dealers of the metropolis, who secured all the chief articles. Among the lots was a very handsome chime and musical clock by the late George Bennett (a relative of Sir John's) which fetched 38 guineas. A fine clock, by Bennett and Co., with modelled bronze figures, representing a palanquin with negro bearers, realised 28 guineas. Another clock, with bronze figures representing Paul and Virginia, fetched 21 guineas. The pictures went at very reasonable prices, "The Lost Boy," by Lewis, being secured by Mr. Macfarlane for £8 10s. The grand piano, by Erard, fetched 38 guineas ; a Sèvres tea-set, £12 ; a brilliant silver-glass mirror, £10 ; and the silver averaged its full value, some of especially fine workmanship realising 14s. 6d. an ounce. A set of twelve chairs with Sir John's monogram on the backs were also sold.

The Charge of Conspiracy to Defraud against Dick and Bromage.

Full Report.

AT the Birmingham Summer Assizes before Mr. Justice Hawkins, Robert James Dick, 31, Joseph Bromage (on bail), and Frederick Bromage, 28, manufacturing jewellers, were charged that they did at Birmingham on divers days and times between December 31, 1886, and July 26, 1887, unlawfully conspire with one M. Bernard to cheat and defraud one John Randall and others, creditors of the said Robert James Dick, of divers large sums of money and divers goods and chattles—to wit, brooches and other articles of jewellery. The defendants also stand committed for trial on charges under the Bankruptcy Act. Mr. Stanger, with Mr. A. A. Hopkins (instructed by Mr. M. A. Fitter, on behalf of the Treasury), prosecuted; Mr. Hugo Young (instructed by Mr. O'Conuor) defended Dick; and Mr. Harris, Q.C., with Mr. Stubbins (instructed by Reece and Harris) appeared for the Bromages.

Mr. Stanger, in opening the case for the conspiracy, drew attention to a balance-sheet got out by the prisoner Dick in the December preceding his bankruptcy which showed him to be £4,000 to the good. When he became bankrupt, rather over five months later, he was £17,000 to the bad, making a loss in that short period of £21,000. According to figures quoted by counsel, Dick appeared to have had £12,000 worth in stock on February 9, 1887. From that date up to his bankruptcy the purchases and sales were about equal; so that the question arose, what had become of that £12,000 worth of stock? Shortly, the prosecution alleged that part of it at least was transferred to the Bromages, and through them and a mysterious gentleman named Bernard, whom the prosecution was totally unable to find, found their way to Mr. Lyons, pawnbroker, of Snow Hill. Very soon after February 9, an entry appeared in Dick's books of £125 worth of goods sold to the Bromages. About that entry no particulars were given, and the bankrupt Dick, when before the Court, expressed his ignorance as to what goods it related to, whether they were ever paid for. Another important point, especially with reference to the Bromages, was that soon after February 9 they began a series of pledgings of an extensive character with Lyons. They had had former pledgings, but counsel said he should identify this particular series with the prisoner Dick. They were ten in number, and said by the Bromages to be made on behalf of the man Bernard, a London commission agent. Special attention was directed to three of the pledgings, in which, said Mr. Stanger, the goods would be traced by means of the books from Dick to the Bromages, and the disposition of the advances could to some extent be fixed. On one occasion of goods being pledged in Bernard's name by the Bromages the money received included a particular £100 note, which note Dick, a few days later, paid into his own banking account. At another time some notes received by the Bromages, ostensibly on behalf of Bernard, were paid into their own banking account; these two circumstances going to show, counsel submitted, that the pledgings were pre-arranged, that the goods originally came from Dick, and were part of the £12,000 worth of stock which disappeared, and that the proceeds were shared by the prisoners. On the eve of Dick's failure all the goods were redeemed by the man who called himself Bernard, and who had disappeared.

Mark Lyons, pawnbroker, Snow Hill, said that the Bromages first had a pledge transaction with him on June 21, 1886. The pawning extended down to April, 1887, and during that time about £6,000 was advanced on the articles pledged. The market value of these parcels would be about £16,000. On February 21, 1888, the Bromages pawned goods upon which he advanced £750, and they were redeemed by Bernard. Bernard redeemed at one time or another goods pledged at £2,725. On March 3, 1887, 49 diamond rings, 46 brooches in cases, a diamond tiara, and 113½ carats of loose diamonds were pledged, and £400 was advanced on them. On March 29, 21 gold watches, 36 silver watches, and 54 low-gold watches were pledged, and £160 advanced upon them. On April 6, 9 diamond bracelets and 12 pairs of diamond earrings were pawned, and £280 advanced upon them. The value of these goods was about double the amount advanced, and they were redeemed by Bernard. Witness also described some other pledges of a similar character. The advance on February 21 was paid in notes to the Bromages. By Mr. Harris, Q.C.: It was a very common thing in the jewellery trade, when they wanted money, to borrow; instead of selling their goods at a loss they pledged them.

Tertius George Alcock, manager of the Snow Hill branch of the Birmingham and Midland Bank, stated that as cashier of the head office, New Street, on February 24 he received from Dick a credit which included the £100 note produced.

A clerk named Barker from the same bank corroborated the statement of the last witness.

J. Sunderlnad, clerk in the National Provincial Bank, proved the issue of the notes to Mr. Lyons on February 21. He also stated that he paid out to Mr. Lyons on April 6, 1887, fourteen £20 notes.

A clerk from the Birmingham, Dudley, and District Bank proved that ten of the notes issued to Mr. Lyons had been paid into that bank by J. and F. Bromage.

James Woodward, manager to Manton and Mole, jewellers, Warstone Lane, Birmingham, deposed to supplying Dick with fifteen gold guards on approbation on April 15. On April 25, Dick returned two, and the rest were charged against him on May 23. The person who came for the guards made some allusion to a telegram. The value on the invoice was £42 13s., and the goods had not been paid for. Witness had bought of Dick several times, but had only sold him goods once or twice.

James Walter Gibson Hill, of the firm of Deeley and Hill, chartered accountants, trustee in the bankruptcies of the defendants, produced their day-books. On March 4, 1887, there was an entry in Dick's day-book of sale to J. and F. Bromage of 47 rings and other goods. On March 4, 1887, in the Bromages' day-book was a sale of the 47 rings to Bernard, the price being the same less 2½ per cent. discount. In Dick's cash-book, under date March 4, was an entry of payment by the Bromages of £189, the amount corresponding with the entry in the Bromages' book. On March 4, in the Bromages' cash-book was entered the receipt from "Mr. Bernard" of £189. On March 30 in Dick's book was an entry of watches, etc., sold to Bromages on approbation, to the amount of £378. In the Bromages' books was a corresponding amount entered as a sale to "M. Bernard," and entries corresponding to these appeared in Dick's and Bromages' cash-books. On April 7 Dick's day-book showed sale to Bromage Brothers of bracelets and earrings to the amount of £645. In Bromages' day-book was a corresponding sale to Bernard, the amount being £677. Corresponding entries were found in both the cash-books. In Dick's cash-book of February 23, 1887, was the receipt of £350 from J. and F. Bromage in notes, etc. On February 24 was a receipt of £150, including a Bank of England note for £100. On February 28 there was a receipt of £200. On March 4 was a receipt in Dick's cash-book from the Bromages of £189. Other entries appeared in two cash-books which appeared to correspond with each other, receipts in one case coinciding with payments in the other. There were entries in the bank pass-books corresponding with entries in the cash-books, which had been made since the bankruptcy, the debtors having been ordered by the Court to post up their books and make out a trading account. The entries were:—"Dr., to sundry purchases," so much; and "Cr., by bank," so much. The stock-sheets of J. and F. Bromage, of May, 1887, set out all the pawning transactions, with the exception of the ten that had been mentioned, the number of the tickets being given and the goods being counted as stock. The ten pawning transactions in question were not mentioned in the stock-sheets or in the statement of affairs. The statements of affairs were put in, and his lordship remarked that the deficiency on Dick's estate was £17,000, and on that of the Bromages £2,500.

Cross-examined by Mr. Young on behalf of Dick, witness said, in giving figures from the books of Dick and the Bromages his object was to show that the goods received from Dick were pawned by the Bromages. Dick and the Bromages had dealings together for a long period, from February 9, 1887. The figures given were only a few selected items which he could fit in with Bromages' books, and not the whole of the transactions between the parties in the course of their trading. In addition to the pawnings he had been able to fit in, he found a great many other pawnings by the Bromages which he was not able to connect with Dick in any shape or form. Between February 25 and April 28, 1887, the Bromages pawned goods for £852, which he could not ascertain were Dick's goods. An entry in Dick's books showed that on March 28 a number of gold and silver watches, to the value of £378, were sent to the Bromages on "appro.," and Bromages' accounts showed that they were pawned on the 29th, and Dick was paid for them on the 30th. From February 8th, 1887, to March 3, there were five entries of goods, amounting to £661 3s. 4d., from Dick to the Bromages, but he was not able to trace the goods which were pawned as coming from Dick. The entry in Dick's book on February 8 was simply "goods" £125, but in every other instance full particulars were entered in the books. The goods pawned on February 21 he could not swear came from Dick. From Dick's books it appeared that on March 4 Dick sold goods to the Bromages amounting to £189 16s. 6d., and he was paid for them the same day. On the previous day there was an entry of goods pawned by the Bromages amounting to £400. Of that total only £189 could be traced to goods supplied by Dick. Between March 4 and 29 he could not trace the pawning of any more goods supplied by Dick to the Bromages. There were goods pawned by the Bromages on March 9, but he could not identify them as Dick's goods. From February 8 to March 29 he was only able to trace two items of goods from Dick pledged by the Bromages. They were the only two pledges redeemed by Bernard. On March 30 Dick sold the Bromages £378 worth of goods. On March 29 Dick was paid £178. The pawning of the goods only realised £160. Between March 30 and April 7 there were three sales—£84, £36, and £75. He had not been able to trace whether they were pawned. On April 7 Dick sold the Bromages £645 worth of goods. £280 was raised by pledging on April 6, and £375 on the next day, the £645 being paid over to Dick. Between April 7 and 14 there were two sales of £33 worth of brooches, and £128 4s. 6d. of general goods. He could not trace that they were pledged. On April 12 the Bromages pledged goods to the extent of £200, and on the 14th he pledged goods to the extent of £180; but he was not able to identify the goods as coming from Dick. After the payment of the £645 to Dick, he could not trace that Dick received any more money until April 16, when he received £45. On the previous day goods had been pawned by the Bromages to the extent of £40. Between April 15 and 25 there were eight transactions between Dick and the Bromages, but he was not able to trace the goods as having been pledged. On April 25 there was a pawning by the Bromages to the amount of £190, but he could not say the goods came from Dick. On April 26 there was a sale from Dick to the Bromages of £200, and Dick was paid the money the same day. The pledging on that date was £300. From February 8 to April 26 there were only three lots of goods supplied by Dick to the Bromages which he had been able to trace and identify as having been pledged by the Bromages. Cross-examined by Mr. Harris, witness said the amount of money the Bromages introduced into their business in 1882 was about £2,000. Their mother had a life interest in the business. Their personal drawings were about £200 a year, but the books were not well kept. During the whole of the five years he did not allege there was any attempt at concealment in the books. There were transactions with Bernard recorded in Bromages' books, and it was from their books and Dick's that he obtained the transactions. The deficiency in Bromages' business when wound up was £2,500, and in Dick's £17,000.

By the Judge.—The total amount of goods supplied by Dick to Bromages between February 8 and April 26 was £2,874 10s. 3d., including £12 bills returned, and the total amount of the payments to Dick in the same period were £2,235 in cash, £642 in bills, and £65 in returns, making a total of £2,946. The total amount of goods pledged comprised in the eleven items came to £2,725. The amount of the indebtedness now due according to the books from Bromages to Dick was £1 10s. 9d., but there were a lot of bills current at the date of the bankruptcy, some of which were honoured and some not. He could not give the invoiced price of the goods from Dick to Bromages because he could not discover from whom Dick purchased them.

Re-examined by Mr. Stanger.—Prior to February 23 the payments by the Bromages to Dick were by bills, and after that date generally by cash.

Max Strauss, managing director of the firm of Backes and Strauss (Limited), London, said he had the general management of the purchase of goods for the firm. He had seen an entry in Dick's books to the effect that on May 21, 1887, he sold witness's firm goods, including gold lockets and guards, amounting to £313 14s. That was only partly true. The firm did not buy the gold guards amounting to £42, nor the seven gold lockets. His brother, Siegfried Strauss, bought goods for the firm. They bought £245 10s. worth of goods from Dick on May 20. The firm had hundreds of transactions with Dick. The firm were diamond merchants, and often sold goods to Dick. On May 20 Dick bought from the firm £499 18s. 9d. worth of goods, and witness's brother bought from Dick on the same day goods to the amount of £245 10s. The firm were creditors to the extent of £1,241 5s. 3d.

This concluded the evidence for the prosecution.

Mr. Stanger, addressing the jury, said that Dick had not accounted for his deficiency, and on several occasions goods were pawned by the Bromages which had been obtained from Dick. He further contended that the dates in the books were wrongly made in order to mislead, and that the story that the goods were Bernard's was idle and ridiculous.

Mr. Hugo Young, on behalf of Dick, argued that the transactions between Dick and the Bromages were ordinary business transactions between two firms in the same trade. It was true that the sales were followed in some instances by the pawning of the goods by the Bromages, but in other cases there was no pawning. There was no systematic disposal by pawning of the goods received by Bromages from Dick, and there was no proof whatever that Dick was acting in concert with the Bromages in the pawning transactions. It was no offence for a man to sell his goods under cost price. A man in difficulties and requiring cash might be induced to sacrifice his goods for ready money, and although Dick had failed in business there was no absolute proof that he had conspired with the Bromages to defraud his creditors. There was no evidence that Dick had anything to do with Bernard in the pledging of the goods, and although he might know Bernard, yet in the pawnings with Lyons of Dick's goods there was nothing to connect Dick with the statement of the Bromages, that certain transactions of pawning with Lyons were in connection with Bernard. Counsel compared the dealings of Dick with the Bromages with the pawnings by the latter, and pointed out that because the Bromages pawned some of Dick's goods it by no means led to the conclusion that they were carrying on a conspiracy together for a particular purpose and a system of pawning for the benefit of Dick. There was no fact to connect Dick with the Bromages at all in any illegal pawning, except the mere fact that on three occasions the Bromages pawned goods received from Dick and paid him for them, the transaction being properly and regularly entered in his books. Even if it were proved that the Bromages pledged the goods with the knowledge of Dick there was no offence, because to sustain the charge against the defendants it must be proved that the pawning was done with the intention of removing goods out of the reach of the creditors in some bankruptcy that was to ensue, that they had in contemplation the bankruptcy of Dick, and that Bernard was to redeem goods so as to prevent them falling into the hands of Dick's creditors. In one or two instances the goods pledged far exceeded the value of the goods obtained from Dick, so that it might be assumed they had been obtained from somebody else. Three alleged identifications of jewellery did not prove a fraudulent system of pawning, any more than a mistake as to the sale of the guards showed fraudulent book-keeping. At the worst the evidence only showed that Dick's goods, sent in the ordinary course of trade to the Bromages, had been pawned, and that the pledging seemed to coincide with payments to Dick. That was not sufficient to convict Dick of conspiracy. The Bromages pawned goods in 1886, long before it was alleged that Dick had anything to do with them; and if Dick wanted to defraud his creditors surely he could have pawned his goods himself.

Mr. Harris, Q.C., on behalf of the Bromages, argued that neither of the charges in the indictment had been substantiated by the evidence. The crux of the case was the allegation that the defendants did, on February 9, 1887, "intend and devise to defraud and cheat John Randall." If that was not proved there was no case, and he contended that it had not been proved. The prosecution had admitted that the defendants might not have known that a bankruptcy was impending, so that it was clear they could not in February have intended to defraud anyone. The defendants did pledge their goods, but it was because they were in business difficulties and required ready money. That was often the case with the most honest business men, who were not charged with conspiracy because they frequently pledged their goods in order to secure ready money. The innocent acts of pledging by the Bromages had been twisted by the prosecution to imply a guilty conspiracy. The prosecution did not indict the defendants for illegal pledging, because they knew it was impossible to sustain such a charge. The defendants were men of irreproachable character, having their future to make and a mother to support, and it was improbable they would have gone in a bungling way to work to defraud their creditors. At any rate, there was a reasonable doubt of their guilt—a most serious doubt—and under those circumstances he appealed to the jury to give the defendants the benefit of the doubt and acquit them.

Evidence as to the character of the Bromages having been given, his lordship proceeded to sum up, and said the date of the conspiracy was immaterial. Whether it was entered into on February 9 or March 19 mattered not, so long as it was proved the defendants had worked together to defraud. He had heard many indictments for conspiracy, but he had never known direct evidence given as to the conspiracy. People did not generally conspire to do illegal things in the presence of witnesses. Juries had to judge by acts, conduct, language, and in this case the jury had to consider whether the whole of the circumstances indicted that Dick and the Bromages were carrying out a line of conduct in accordance with an understanding, or conspiracy. It must be remembered that between February and June, 1887, Dick had lost £21,000, for in December, 1886, his assets exceeded his liabilities by £4,000, and in June he was £17,000 to the bad. That fact alone proved nothing against the Bromages, and up to February there was no ground to suppose that any illegal bargain or understanding existed between them. The only man who could have given direct evidence as to the relations between Dick and the Bromages between February and June was Bernard, and Bernard was missing, as well as the goods he redeemed. Who was this Bernard? Mr. Lyons had nothing to do with him. Bernard had redeemed goods upon which £2,725 had been advanced by Mr. Lyons, and the goods had been valued at double the amount advanced upon them. On February 21, 1887, when the first transaction was carried out, Bernard was not known to Dick. Dick, however, in his bankruptcy examination, said that on that day Bernard called upon him, and, introducing himself, was allowed to purchase £158 worth of goods, and to pay in bills. It was a very curious thing that that took place on the very day the first pawning took place, when £700 was lent to the Bromages by Mr. Lyons on jewellery which was afterwards redeemed by Bernard. Was it likely that Dick would entrust a man, a stranger, who introduced himself, or brought a reference, with £158 worth of goods, without knowing something more about him, and without making any enquiry? It was alleged by the prosecution that that was a sham transaction. Joseph Bromage, in his examination, said he had pledged goods to the extent of £4,000 for a man in London; but it was strange that a man should come from London, where there were plenty of pawnbrokers, to pledge goods in Birmingham. Joseph Bromage further said he did not know who Bernard was, or where he lived, and he could not form any idea what amount of business they did with Bernard. Bernard asked them to pawn goods for him, because he was short of money. He could not give any other reason why Bernard should ask them to pawn the goods. The prosecution did not attempt to show that all the goods pawned by the Bromages came from Dick. The transactions which threw a light on the whole matter were three, and the prosecution sought to show that the Bromages were lending themselves to pawn Dick's goods in order to assist him in getting rid of that large stock which vanished, and which otherwise would have been available among his creditors. On March 4, 1887, Dick sold to the Bromages goods for £189. The Bromages then sold them to Bernard for £199, and Bernard pawned them with Mr. Lyons. According to Mr. Lyons the goods were worth double the amount lent upon them, and, therefore, it came to this—that Dick sold goods of the value of nearly £400 for £189, he being in no necessity for money, because in February he had £12,000 worth of stock, and at Christmas a capital clear of all liabilities of £4,000. It was an odd thing, if the Bromages wanted the goods to pledge, that they should buy them for £189 and sell them to Bernard for £199. Why did Bernard, who was so poor that he had to sell his own goods, want to buy £189 worth simply to pawn with his stranger friend, Mr. Lyons? Where were the goods now? Why, they had been redeemed by Bernard, and no one could say where they were. On April 7, according to defendant's books, Dick sold seven bracelets and twelve diamond bracelets for £645, and the Bromages sold the goods to Bernard, and on the previous day the Bromages pledged bracelets and diamond earrings for £2,000. So with the watches on March 30, and it was for the jury to say whether those coincidences justified them in believing that Dick and the Bromages had fraudulently disposed of Dick's goods for the purpose of depriving Dick's creditors of them in the event of his bankruptcy, which was brought about in the following June.

The Jury, after a short deliberation, found the three defendants guilty; the Court then adjourned.

On the defendants being brought up for sentence, Mr. R. Harris, Q.C., on behalf of the Bromages, mentioned that when they succeeded their father in the business they brought £1,000 into it, and their mother allowed them to introduce a further £800. They had borne an irreproachable character up till the time they were drawn in this affair. Joseph had been a very great sufferer, and had had no less than five operations performed upon him during the last year. He was a married man in a most delicate state of health.

His Lordship: What had painfully weighed upon his mind was that there had not been the smallest endeavour on the part of either of the prisoners to assist the creditors to recover the thousands of pounds worth of stock which had been fraudulently abstracted. Addressing the prisoners his lordship said he had considered the case with a very great deal of anxiety and carefulness, and he regretted to say that the result of his consideration was that the fraud was one of a very serious character. There could be no doubt at all that the prisoners had defrauded Dick's creditors to the extent of thousands of pounds by the abstraction, between the months of February and June, 1887, of large quantities of stock, which were pledged—fairly enough so far as the pawnbroker was concerned—at half their value, and which were redeemed by a man named Bernard. This man Bernard, who had never made his appearance, and to trace whom the prisoners had given no assistance, had managed to get into his possession the whole of the property mentioned in the indictments, and not one single particle of it had been rendered up to the trustee or the receiver under Dick's bankruptcy to be divided amongst his creditors. He looked upon this, in a commercial community, as a very serious and grave fraud. They were not indicted for the perpetration of fraud, but for having wickedly conspired and confederated together for the purpose of accomplishing it. Everybody knew that a man who got the benefit of the Bankruptcy Act was bound to act honestly, and to give up to his creditors all that he had, in order that they might have so much divided between them as he had to divide: and that fraudulently to make as it were a purse, and to steal from the creditors property which should be divided among them was in itself a very grave and a very serious crime, and even where small sums had been abstracted he had known punishments very severe, and having regard to the extent of punishment that could be inflicted upon a fraudulent bankrupt—severe sentences which had been passed, because it would never do in a commercial community like Birmingham to allow it to go forth that an offence of the kind was a trifling one, or should be passed over with a light sentence. At Christmas, 1886, Dick had a surplus over and above all liabilities of £4,000, and had stock-in-trade to the extent of £8,000. In February he had stock under his control to the extent of between £11,000 and £12,000 and there was no reason to suppose that the surplus capital of £4,000 had diminished seriously. Between February and July, the month when he was adjudicated a bankrupt, his estate had been so dissipated or abstracted that there was a deficiency of £17,000, and no mode of accounting for this had been discovered or offered. If Dick could have given an honest explanation, undoubtedly he would have given it. The account that all the prisoners gave of Bernard was equally unsatisfactory. As to the Bromages, he was not sure that he was right in the distinction which he was about to make between their case and that of Dick, because they had not even the miserable excuse that they were tempted to it. If he were to pass upon them a light or trivial sentence, it might be deemed by all right-thinking persons as an encouragement to men to play for high stakes, such as Dick had played for, if they felt that the offence could be expedited by anything like a merely nominal or trivial punishment, and so he thought it would be said he had greatly forgotten his duty to the public if he were to look upon it as a light matter. Under the circumstances he felt it his duty to pass a sentence which he knew would be to them one of considerable irksomeness. If it should transpire that one of the prisoners should be ill, he would be at perfect liberty to make an appeal to the proper quarter, when it would receive attention, but he, in passing sentence, had only to look at their present condition, at the wicked frauds they conspired together to perpetrate and succeeded in perpetrating. The sentences he was about to pass were the highest which he could pass, having any regard at all, as he had, for the administration and the due and proper punishment of crime of this description. The sentence upon Dick would be fifteen calendar months with hard labour, and the sentence upon the Bromages was that they should be kept to hard labour for twelve calendar months.

Committal of the Moseley "Baronet."

AT the Birmingham Police Court, on the 1st ult., Henry Beresford Moore, alias Coote (45), commercial traveller, The Firs, Trafalgar Road, Moseley, was charged on remand with obtaining goods by false pretences from Messrs. Collett and Co., jewellers. The prosecution was again conducted by Mr. Dorsett (instructed by Messrs. George Burn Lowe and Sons), and Mr. Stubbins (instructed by Messrs. Jaques and Sons) on behalf of Messrs. Woolley and Sons: while the prisoner was defended by Mr. Peet.

Mr. Dorsett explained that the accused laid claim to the Ballyfin estates, which belonged to Sir Charles Henry Coote, and which yield £20,000 per annum. This got to the ears of Mr. Shingler, manager of the *South Birmingham News*, and it was arranged that he should be interviewed by a member of the staff named Mr. A. Harlow. On April 13 he was interviewed, and then gave a long account of his claim to the estate. In due course this statement appeared in the newspaper, and was fully sanctioned by the prisoner. Subsequently he called upon Messrs. Collett and Co., and saw Mr. Wright, a member of the firm, and said, "No doubt you have seen my case in the papers. I am Sir Henry Beresford Coote." He then proceeded to make known his wants. A friend of his in Ireland was in want of a diamond ring. Before it was given to prisoner, however, another partner was called upon the scene. Nothing was done up to May 30, when the prisoner stated that his friend desired to have the ring at once. He called again on the following day, and was then told that Mr. Collett would speak to him later in the day on the subject. Mr. Collett went to his house at Moseley, and being presented to the prisoner, he said, "Sir Henry Coote, I believe," to which he graciously replied "Yes." Then they had a long chat about the Ballyfin estate, which prisoner described at length. He added that his half-brother, the present baronet, had admitted his claim, and the only difference between them was the amount which he (the prisoner) would allow him. The whole town of Ballyfin belonged to him. The prisoner then asked to be permitted to submit a diamond ring and three loose stones to his friend, promising that if he selected one of the stones it would be returned to be set. The upshot was that Messrs. Collett let him have the articles on approbation. An approbation-note was given, made out in the name of "Sir Henry Beresford Coote." Prisoner went again on June 6, and saw a man named Hubbard, who enquired who he was. "Sir Henry Beresford Coote," replied the prisoner. He then applied for a gold albert chain. He had another interview on the 15th of the same month, and was then asked when he proposed taking possession of his property. He replied that there was a dispute as to the possession of £40,000 or £60,000 in the bank. The money was claimed by the holder of the estates, and until that question had been settled he could not move further in the matter. He had given instructions to his bankers not to pay the money. On this occasion he gave an order for a diamond ring for his wife and one for himself, which, together with the albert chain, amounted to £71 5s. When the firm made some suggestion of payment, the accused proceeded to convey to them that his claim had been fully admitted, and backed this up with a request to accept a bill of exchange. He gave a bill for the amount. By this time the approbation articles were outstanding, but the prisoner showed no disposition to return them. Collett eventually asked him to send them back, and was told that prisoner's friend would keep the £63 ring. The accused added to this remark that he should take possession of the property immediately the hitch over the £60,000 banking account was settled. The prosecutors began to agitate for the return of their property, and were told by the prisoner that his Dublin friend must have been away for awhile. It turned out, however, that at the time prisoner was making these excuses he had actually pawned the whole of the goods. Despite this, he again patronised Messrs. Collett, and explained that his wife's ring had a flaw in it. Of course, she could not think of wearing it under such circumstances. "She must have a ring quite pure, and in keeping with her position," he replied. This went on for awhile longer, and the prisoner was asked for the name of his solicitor. He became quite perky, and point-blank refused. Further enquiries were then made, and prisoner was taken into custody.

Henry Greaves Shingler, manager of the *South Birmingham News*, said when he first spoke to the prisoner he remarked, "I believe you are a claimant to a large Irish estate?" Prisoner replied, "Yes, it's strange, but it's quite true." Witness arranged for an interview. When addressing the accused he always referred to him as "Mr. Moore." Prisoner took exception to this, however, on one occasion, and said, "Sir Charles, I presume you mean." He added that the whole thing was fully admitted. In a whisper the accused mentioned something about Sir Henry Algernon Coote.

Cross-examined, witness said that when he received a telegram from the defendant asking him to withhold the information concerning his claims to the Coote baronetcy it was too late to withhold the report, because the issue of the newspaper containing it was partly printed off, and the printing of the rest could not be stopped. In re-examination, the witness said that the publication could not be prevented except at a cost of about £10. Subsequently witness received a telegram from the defendant congratulating him on the manner in which he had published the report of the interview.

Mr. A. C. Harlow, a reporter on the *South Birmingham News*, gave evidence of the interview which he had with the defendant on May 30, when he told him the story which was published in the newspaper. Witness wrote the defendant's statements in shorthand at the time, and subsequently submitted a proof of the transcript to the defendant, from the corrections in which the report in the newspaper was published.

Cross-examined, witness stated that when it was suggested that witness should "interview" him on the subject of his claims, he consented, but added that he did not know what good it would do him, and he thought it might damage his claim.

Mr. Frank Edwin Wright, a partner in the firm of Collett and Co., jewellers, 65, Caroline Street, described the visits of the defendant to the warehouse of his firm at the end of June, when he gave his name as Henry Beresford Moore. When witness saw him on May 29, he said, "Doubtless you have read of my case in the papers under the heading of 'The Moseley Romance.'" He then explained that he wanted some rings for a friend in Dublin. Witness said he would consult with his partners, and having done so, it was arranged that Mr. Collett should take some samples to the defendant's house. When defendant visited the warehouse the next day, witness said, "Good morning, Mr. Moore," and the defendant replied, "Excuse me, but my name is not Mr. Moore; I'll be holder of that name no longer. I am now Sir Henry Beresford Coote." After further conversation, Moore said it was a matter of £60,000, and that, as now he was going into three houses—one in Ballyfin, one in Dublin, and another in London—he could not very well do it on the modest income of a commercial traveller. Then he made a request for a diamond ring for his wife, whom he affectionately referred to as "his dear mamma," and one for himself. Of course these ornaments were rendered necessary by the difference of the society in which he was about to move. He assured them that his name would be good at the bank for any amount. With regard to the approbation goods, he remarked that he was going to London, where he would see his friend, and that he would either bring them back with him or send them on directly. Witness called again, and was introduced to Mrs. Moore as "Lady Coote," for whom he selected a ring with five diamonds. He picked another one for himself. The two were worth £60. The conversation then turned upon settlement. Prisoner consulted her "ladyship," and then announced that a four months bill would be preferable. On July 15 witness encountered the prisoner in Dublin, at the Gresham, where "Sir Henry and Lady Coote" were staying. Witness requested him to return the goods he had had on approbation. He mentioned that there were some ominous rumours about the truthfulness of the "baronetcy romance." He pooh-poohed the announcement, and added that such rumours were groundless. Witness referred to a statement that he had cashed a cheque which had been dishonoured, and had promenaded some one else's pony as his own. He stoutly repudiated the assertion. Witness then pressed for the name of his solicitor. Prisoner replied, "I cannot give it you. There is such a large amount at stake, and my solicitors would not care to be troubled about such a trifling amount as £250." They argued, and got to high words, and witness then withdrew. Witness let him have the goods believing that his statement was true, and that he was Sir Henry Beresford Coote, of Ballyfin, or he would not have trusted him.

Herbert Edward Collett, a member of the firm of Collett and Co., stated that he went to see the accused at Moseley on May 31. Witness was shown into the room, and, seeing the prisoner, said, "You are Sir Henry Coote, I believe?" He answered "Yes." Witness then congratulated him upon the change in his fortune. He replied, "Thank you. I suppose you have read my case in the papers." Witness intimated that he was well read in the romance, and enquired when he intended taking possession. Prisoner informed him that he was going to Ballyfin to do so. The only obstacle was what allowance he should make the present holder. Witness replied that it was not compulsory to allow anything. "Quite right," responded the "baronet" with wonderful magnanimity, "but I don't want to be harsh with him. The property yields £60,000, and I have offered him £20,000 a year, but he does not seem inclined to accept it." On June 21 witness called at The Firs to enquire what had become of the stones sent on approbation on May 31. He replied that his friend was away, and that he would telegraph at once to him. Five days later the goods had not been returned, and witness again called on the prisoner to enquire about the stones. Moore replied that his friend in Dublin was not a very business-like man, and would not attach much importance to the speedy return of the stones sent under such circumstances. Moore also called witness's attention to the ring supplied for his wife, and pointing to a flaw said, "Lady Coote will not wear this with any flaw in it. My dearest mamma must have diamonds to suit her position." The ring was taken away and the stone changed, after which it was returned. On June 28 prisoner ordered two seals, and on July 2 prisoner and his wife called at the warehouse—Mrs. Moore being introduced as Lady Coote—when she selected a diamond-and-pearl brooch. Witness said he parted with his goods because he believed that the prisoner had come into large estates, and was Sir Henry Beresford Coote, as stated by him.

Richard Riley, assistant to Mr. W. H. Wood, pawnbroker, High Street, stated that he received a diamond ring from the prisoner on May 31, and advanced £2 10s. Witness lent £15 on a loose stone on June 1, and ten days later he received two other loose diamonds, on which £15 was borrowed. These stones and rings had been identified by the prosecutors, who invoiced them to the prisoner for £135. There was another pledging on June 19, a diamond ring for £8, and there was another ring on July 1 for £3. There was a seal on July 4, on which £1 10s. was raised. In each case the person gave the name of Mr. Moore, but varied the address considerably.

Frederick Towers, manager to Mr. Wood, pawnbroker, 87, New Street, said the prisoner pledged a single diamond ring on June 20, for £16, in the name of Henry Moore, 98, Moseley Road. The witness protested against an allegation by the prosecuting counsel to the effect that Mr. Wood had refused to help the police to the recovery of the pawnings. No one had done more to help them than witness's firm. Superintendent Black replied that he sent Detective-Inspector Ore twice to Wood's, and only one article was discovered. When he (Black) found the pawn tickets he went himself and enquired if any more had been found, and was told no. He asked "Have you made further search?" and they answered "Yes." "Then," said Black, "turn the property up, for I have the tickets." Towers was going to add something more, when the Stipendiary told him to stand down. The counsel's remarks were quite justifiable. If the things were pledged in one name and one was discovered, the whole lot might have been. Detective-Inspector Stroud said that he executed the warrant for the prisoner's apprehension on July 16, in Dublin. He remarked: "I didn't think Mr. Collett would do this. The fact is, I have given a bill which is not due." He further added that he did not intend to defraud.

Superintendent Black said that he searched the prisoner's house on the 18th ult., and found eight pawn-tickets in a leather case referring to Messrs. Collett's jewellery. In another box he came across a Bible bearing the age of prisoner and family. Prisoner was described as Henry Moore, born 1841.

This concluded the case for the prosecution, and Mr. Dorsett made known that he did not propose calling the present baronet at present. Mr. Peet contended that there was no false pretence. Prisoner had made a claim, and no evidence was called to show that it was not true. The Stipendiary replied that there was sufficient to go to a jury. Mr. Turpin, solicitor to the Coote family, of Ballyfin, had stated that the accused was not a member of the family, and there had been no claim to the estate, or he would have heard of it. The present baronet had certainly not forfeited his ownership. It had been proved that the prisoner set himself up as the real owner, and not merely a claimant, and upon this he had obtained goods.

Prisoner reserved his defence, and was committed to the Sessions.

Mr. Peet asked that the case might be dealt with at the Assizes. The Stipendiary did not consider it was a case for a Judge, and if the defence liked they could apply to a Judge in Chambers to have the case tried at the Assizes.

A further charge was preferred against the accused of stealing certain samples, the property of Messrs. Thomas Woolley & Sons. Mr. Stubbins said the facts of the case were simple. About January 5 prisoner was engaged as commercial traveller for Messrs. Thomas Woolley & Sons, electro-platers, Caroline Street, Birmingham. He proved an utter failure, only getting £10 worth of orders during three months, and the prosecutors asked him to return the two cases of samples he had received, and which he had agreed not to dispose of in any way whatever. Messrs. Woolley only received one of the cases back, and letter after letter being fruitless, Messrs. Jaques & Son were instructed to apply for the missing case. In reply, the prisoner wrote "that he was surprised to hear that the case had not arrived. He gave instructions to the railway authorities at Bath to forward both cases to Birmingham. He supposed one must have gone astray in transit, but he would make enquiries, and if successful would send them to the prosecutors." He also added that he had a claim of £5 against the firm, according to his agreement. Messrs. Woolley sought to recover the goods from the prisoner through the County Court, but when Detective-Superintendent Black discovered that the whole of the goods had been pawned by the prisoner directly after he received them they withdrew from the action. Evidence was given in support of this statement, and prisoner was committed on this charge also.

Maud *v.* Perrier.—Action for Slander.

At the West Riding Summer Assizes, an action was brought last month by Edward Fletcher Maud, solicitor, Leeds, against Marie Albert Perrier, wholesale watch importer, 15, Charterhouse Street, London, for slander. The plaintiff was represented by Mr. Lockwood, Q.C., and Mr. Walton. Mr. Waddy, Q.C., and Mr. Cyril Dodd were counsel for the defendant.

Mr. Lockwood, in opening the case, said that Mr. Maud succeeded his father in practice as a solicitor. He was a member of the Leeds, and also of the Yorkshire Law Society. Plaintiff's father had acted for Messrs. Tanenberg and Sons, jewellers, Leeds. On Mr. Simon Tanenberg retiring from business, the sons succeeded him. In June, 1888, they got into difficulties, and they consulted the plaintiff with reference to their position. Manufacturers of jewellery in London and Birmingham were the chief creditors; and, in order to ascertain their views, the plaintiff decided to hold meetings in those towns. The first meeting was held in Birmingham, on July 11. Certain resolutions were discussed, and the creditors present were content to accept a composition in order to avoid the expense of bankruptcy proceedings. The next day a meeting was held at the First Avenue Hotel, London, at which the plaintiff told those present what had transpired at the Birmingham meeting. He then renewed the offer of 20*s.* in the pound, to be paid in monthly instalments, which was made to the Birmingham creditors. Mr. Ehrenfeldt, who was present on behalf of Mr. Perrier in the earlier stage of the meeting, objected to the resolutions being adopted until the debtors had furnished a statement of affairs. The suggestion was made by Mr. Perrier, who had meantime arrived, that Mr. Ehrenfeldt should go to Leeds and make a report, which was to be submitted to a subsequent meeting of London creditors. Accordingly Mr. Ehrenfeldt visited Leeds, and made an investigation into the estate of the debtors, every facility being afforded him in his inquiries. A report was drawn up, and another meeting was held at the First Avenue Hotel on July 28. The defendant was present. The plaintiff read the report of Mr. Ehrenfeldt, and a discussion followed. The creditors were of opinion that it was inadvisable to wait for the payment of 20*s.* in the pound, and a resolution was passed to the effect that a deed of assignment should be drawn up. The deed was prepared, and submitted to the defendant for signature. He, however, refused to sign it, and subsequently presented a petition in bankruptcy against the debtors. On March 27 a meeting of creditors was held in Birmingham, by which time the Bankruptcy Court had secured jurisdiction over the affairs of the debtors. In the course of a discussion the defendant asserted that the resolutions signed on July 28 in London were not read over to the meeting. He was at once contradicted by Mr. Poppleton, the trustee, and by the plaintiff. The defendant then said to Mr. Maud, "I would rather believe the other creditors than you." Plaintiff retorted that it was a falsehood to say that the resolutions were not read over, and then the defendant, in the hearing of all the gentlemen present, stated that the signatures of the creditors to the resolutions of July 28 were obtained by the fraud of the solicitor who then represented the debtors. The statement met with a prompt and indignant denial from Mr. Bowling, the Official Receiver for Leeds, who told the defendant that the plaintiff was incapable of committing a fraud of that description. The defendant, however, sat in silence, and so far as could be judged by his demeanour, he seemed content to allow the accusation to go forward to the representatives of the creditors from Birmingham, London and Leeds that Mr. Maud had been guilty of a fraudulent misrepresentation, and had, by that fraud, obtained the signatures to the document. That was the cause of complaint. A more serious charge could not possibly be brought against a professional man. Mr. Maud felt that he could not sit down under the imputation. He felt that he must have a widespread apology. He insisted that the apology should be inserted in various newspapers which circulated in the districts from which the gentlemen came who had heard him slandered. Several letters passed between the solicitors acting for the plaintiff and the defendant, and in the end a writ was served on the defendant.

Plaintiff then gave evidence in support of the statement made by the learned counsel. In answer to Mr. Waddy, he said that the slander was not published in any newspaper.

Mr. John Bowling, Official Receiver for Leeds, gave corroborative evidence. In cross-examination he stated that on several occasions he had endeavoured to get a correct statement of affairs from Messrs. Tanenberg. He got a satisfactory statement given to him about three weeks ago, and it appeared that the assets amounted to about £200, whilst the liabilities were nearly £3,000. Book debts amounting to several hundred pounds, for which the debtors claimed credit, were hopelessly bad.

Mr. Poppleton, the trustee, and Mr. W. B. Brown, public accountant, Birmingham, also gave evidence on behalf of the plaintiff.

Mr. Waddy, in defence, observed that the defendant had never intended to cast any imputation whatever upon the plaintiff, and that he was told so at the very earliest moment. Plaintiff had been misled by the debtors, and the imputation of fraud was applied to them. The defendant was certainly of opinion that the resolutions had not been read. He now repudiated all suggestion of fraud on the part of the plaintiff. The altercation at Birmingham, Mr. Waddy pointed out, took place not at a public meeting, but at a private gathering of seven gentlemen.

The defendant in the course of his evidence said that he did not impute fraud to Mr. Maud, but to the Tanenbergs.

Mr. Hillman, managing clerk to Mr. Blackham, solicitor, Birmingham, who was present at the meeting in question, said that the defendant, referring to the resolution previously passed, said to the plaintiff, "I am no more a liar than you are, but I do say the signatures to the resolutions have been obtained by misrepresentation or fraud." He did not say that the plaintiff had obtained them by misrepresentation or fraud.

Further evidence having been given, the jury found a verdict for the plaintiff; damages £50. His Lordship, Mr. Justice Mathew, accordingly gave judgment for that amount, with costs.

Half-hours with our Manufacturers.

III. Messrs. Purdom and Stokes.

MESSRS. PURDOM and STOKES, of Optic Works, Great Tindal Street, Birmingham, are the most extensive manufacturers of spectacles in the trade, and it was to their establishment that I naturally made my way when I desired to find out some details concerning the practical construction and production of a pair of spectacles. When I called, both partners were on the premises. Mr. Purdom having been sent for, I told him my errand.

"Well," he said, "I've no objection whatever to you seeing all there is to be seen here, but as regards publishing what you see in *The Watchmaker, Jeweller and Silversmith*, I don't know what to think, because there will sure to be inquiries and we shan't know what to do with them, as we are already working up to our full capacity."

"I'm very glad to hear it," I replied, "and I wish the same might be said by all the manufacturers whose interests are cared for in this journal."

"However," said Mr. Purdom, "I will send for my partner, and perhaps he will show you round."

Mr. Stokes soon made his appearance and after a little more chat, decided to take me round his works and explain the various processes to me.

We commence by inspecting large fragments of Brazilian pebble which is far more satisfactory for spectacles than the finest glass procurable, as it takes a greater polish and is not at all liable to change its consistency even during the lapse of many years.

The first of the workshops which we enter, Mr. Stokes informs me is the "slitting shop," and here we observe a number of middle-aged men seated at troughs engaged in "slitting" the rough pieces of pebble into flakes of about the thickness required for a spectacle lens. This "slitting" is accomplished by a circular plate of steel rapidly rotating in a horizontal plane.

The slitter takes a piece of the pebble in his right hand and gently presses it against the periphery of the plate which he keeps supplied with water and pulverised diamond in the form of a paste with his left hand. This diamond paste works on to the edge of the plate and so cuts the pebble. It would be impossible to cut it otherwise, the hardest steel being quite useless.

Mr. Stokes remarked that "this process is attended with some risk to the operator, as the plate inflicts very nasty cuts if the hand is brought into contact with it during rotation; but we very seldom have an accident, as the hands are all skilled workmen."

"This is very interesting," I remarked, "and what is the next process the flake is subjected to?"

"They are all collected," Mr. Stokes replied, "and removed to the 'grinding shop,'" to which he now conducted me.

On our way we visited a neat little forge in the yard, where a blacksmith is continuously employed in forging the "sides" of spectacle frames. This is not at all usual in the trade as most of the "sides" are cut out of sheet steel in a press. It is obvious, however, that a forged side, hardened and tempered, must be far more serviceable than a pierced one. These "sides" are forged out of one small rod of steel, and the nimbleness acquired by the forger in reducing a square bit of steel in an exceedingly short space of time to a spectacle frame "side" is remarkable to see. Leaving the forge we pass up some steps into the "grinding" room and here we observe boys engaged in mounting the flakes of pebble derived from the "slitting" shop, upon pieces of of cobblers' wax about the size and shape of a plum. These mounts are then placed in the "tools," which are all worked by mill power. The grinding which goes on in these tools is accomplished by various sizes of emery, and before a pebble is ready to be polished it has to have its surface gradually smoothed by *fifteen* different sizes of emery, from the roughest to that as fine as the finest dust. In the grinding shop the pebbles are altered very considerably as to size and shape from what they were when delivered from the slitting shop. After the "grinding" shop they are passed on to the "trueing" room, where a much finer kind of grinding takes place.

"After all this has taken place," said Mr. Stokes, who very kindly pointed out many small things which I should probably have missed, "the pebbles are sent into the finishing room to be polished," and as he spoke we entered this department, which is rather startling at first sight, for there is a long row of some sixty feet in extent, of spindles, in a vertical position, all rapidly revolving, and at their lower extremities having a polishing tool fixed which has a most eccentric motion, which would lead one at first to suppose that all was not going well; but "things are seldom what they seem," and we find that it is in this very eccentricity that the process is effective.

"Here the lenses are finished," said Mr. Stokes, and here we leave this portion of the business and visit the shops in which the spectacle "frames" are constructed. This is scarcely a less important process than the fashioning of the lenses themselves, and we find that to be good and useful, spectacle frames must be produced by hand work alone.

By this time we had arrived at another portion of the premises and entered one shop in which the frame making was going on.

"You see," said Mr. Stokes, "a spectacle frame to be good must be hand-made, and here the peculiarity between English and French work is most pronounced. Most of the French spectacle frames are produced by machinery; and I won't say all, but most of the English work is done by hand, not always by the spectacle-maker, but by someone he employs as an outworker. Here we make everything ourselves."

While making our retreat from the frame-making room, Mr. Stokes informed me that they had recently taken in the premises next door, and so increased the space at their disposal, thereby being enabled to make a greater output. The additional premises consist at the front, of a "sorting room," where a professional "sorter" (an occupation similar to diamond sorting) accomplishes the delicate process of sorting into five different qualities the polished lenses submitted to her.

Leading from the sorting room is the "glazing room," a long apartment of some 100 ft. in extent, in which there are fourteen girls employed in the fitting of the lenses to the frame. This is a process which requires care and ingenuity, and all the girls employed are tidy and skilled in their vocation and earning good wages. It has been the custom to poke the "glazer" into any odd corner in the works which could be found with a grindstone and a can of water; but here the room is devoted to glazing and each girl has a grindstone, with trough, driven by steam, and is seated in front of a window so that each one has plenty of light, space, and every facility for healthful and pleasant labour. The glazer uses a kind of rough nipper to pinch away the superfluous material round the lens, and, when with this instrument she has brought it roughly into shape, she uses her stone and grinds the edges true and makes them fit exactly into the frame. Inserted into their places she then screws them in, and the glazed spectacle is ready for finishing and the warehouse.

We pass from the glazing room to the warehouse and there find a wonderful arrangement of "pigeon-holes," which are all numbered and extend themselves in every direction. When it is remembered that there are some 1500 lenses of various kinds and combinations, it can readily be imagined how useful these holes are! In a business like this of Messrs. Purdom and Stokes, where there is so much detail, it becomes absolutely necessary that some very workable system must be adopted in order to carry it on successfully, and the best way of doing it is the pigeon-hole and drawer arrangement of which I have just spoken. A large proportion of the goods are sent away in post parcels, and there is always a little mild excitement going on at night when the various parcels are being prepared and addressed for despatch to the office.

All this as it concerns the manufacture of spectacles of the ordinary kind where nothing of a special character is required, but there is another branch of the business which is altogether "special," and which consists for the most part of making up the prescriptions of oculists and ophthalmic surgeons. This is a very complicated and in some cases, very expensive matter, for very frequently a large amount of care, time, and material is expended over a single pair of glasses.

In some of these special things glass is used instead of pebble, and some of the glass lenses are of very peculiar construction. They consist for the most part of a peculiar kind, termed astigmatic lenses, and are used to correct astigmatism, which is an error in the refraction of the eye. There are other kinds also, which, in addition to having the convex or cylindrical forms, are wedge-shaped. As the manufacture of these peculiar forms is attended with considerable complication, Mr. Stokes pointed out to me a series of racks against the walls on which the tools for producing such lenses are kept in proper order.

Then besides special lenses there are, of course, special frames, and these are made in a separate room to that in which the ordinary ones are produced. There is also a room in which old and worn glasses are renewed or altered. The polishing and tinting of the frames is managed by holes and the application of heat respectively.

Messrs. Purdom and Stokes have lately added to their business the making of high-class gold frame spectacles, and have just imported from London for the purpose, skilled workmen, who work in a room apart and take particular care of the filings. They are mostly intended for the construction of special pairs of spectacles.

Another speciality is the "folding gauze Bowman goggles," which have been adapted for the first time in England by Messrs. Purdom and Stokes from the French. They are a great improvement on the old things which look like the little gauze sifters you hang on teapot spouts. The gauze is just as effective but renders the goggle far more sightly and portable. Two pairs of the Bowman goggle will go into the space occupied by one of the old sort.

Having seen all the processes, I went out into the engine shed to see what supplied the motive power for all these processes and find it accomplished by means of an eight-horse power Otto gas engine, which has been working now for several years and is found most effective. Of course, the work it does is not of a heavy description, but on the other hand, there is a good deal of it.

Having then seen all that was to be seen, and after having talked over the present state and the prospects of trade with the proprietors of the business, I left them, and set about recording my impressions of one of the "Half-hours with our Manufacturers" series. W. Kineton Parkes.

The Australian Pearl Fisheries.—In the House of Commons last month Mr. W. M'Arthur asked the Under Secretary of State for the Colonies whether it was true that in 1887 certain British pearlers, employing 87 vessels off the North-West Australian coast, petitioned the Secretary of State for the Colonies against the grant of Responsible Government to Western Australia without the recognition of their right to fish beyond the three-mile limit untaxed: whether protests had been lodged by the north-west pearling fleet, by the London Chamber of Commerce, and by the Chamber of Shipping against the Western Australia Pearl Fisheries Act passed by the Federal Council of Australia in February, 1889; whether representations had reached him that the principle introduced in this Act would infringe the main principles recognised by the Chamberlain Commission, and might tend to the transfer of the pearling fleet to a foreign flag; and whether the Secretary of State was willing to advise the Crown on this Act on its merits, and what action had been taken in the matter. Baron H. De Worms: A petition to the effect stated by the hon. member was received by the Secretary of State in October, 1887, and was referred for the consideration of the Government of Western Australia; and extracts from the Governor's reply were communicated to the parties interested in the petition. Protests, such as are described in the question, were also received at the Colonial Office, in more than one of which attention was drawn to the injury which it was alleged must occur to colonial pearl fishing vessels. The subject of this reserved Bill has been carefully considered by Her Majesty's Government, who have been advised that it is within the powers conferred upon the Federal Council by the "Federal Council of Australia Act, 1885," and they have decided that they would not be justified in recommending Her Majesty to disallow the Bill.

Board of Trade Returns.

The clocks and parts thereof imported during July are valued in the Board of Trade Returns at £34,995, in comparison with £33,373 for the same month of last year, and £27,665 for the July of 1887. The following shows the sources of supply :—

July	1887.	1888.	1889.
From France	£13,072	£14,205	£16,046
,, United States ...	£7,543	£4,296	£6,132
,, other countries ...	£7,050	£14,872	£12,817

The seven months of this year give a total record of £245,444 against £256,126 for the same period of last year, and £215,266 for the same months of 1887.

The watches and parts thereof imported reached the value of £53,539. The July of last year showed a record of £57,734 and that of 1887 £63,371. For the first seven months of this year the watches imported are valued at £396,401, in comparison with £343,619 for the same period of 1888, and £424,531 for that of 1887.

The plate and plated and gilt wares exported during July reached the value of £35,736, against £31,750 in the same month of last year, and £23,327 in that of 1887. The seven months of this year give a total of £225,203, in comparison with £203,763 for the same period of last year, and £158,208 for that of 1887.

The total value of imports of all descriptions for July reached the value of £35,873,247. The same month of last year gave the figures as £30,706,412, and that of 1887 £28,958,156. The first seven months of this year give a total of £243,581,782, in comparison with £220,398,519 for the same period of 1888, and £207,748,215 for that of 1887.

The exports of British and Irish produce for the same month are valued at £22,050,379, against £20,762,178 for July of last year, and £19,181,395 for that of 1887. The seven months of this year give a total value of exports of £141,038,332 in comparison with £133,480,123 for the same months of last year, and £123,477,285 for the same period of 1887.

Duty upon Silver Plate.

AFTER our August number had gone to press, the Earl of Northbrook, in the House of Lords, called attention to that part of the Royal Commission upon the Precious Metals which related to the duty upon silver, and moved for a copy of any correspondence that had since taken place between the India Office and the Treasury upon the subject. The noble lord reminded the House that during the last fourteen years the gold price of silver had fallen from 5s. to 3s. 6d. One of the principal causes was that great embarrassment had been caused to the finances of India, owing to the fact that she had to pay this country some fourteen or fifteen millions sterling in gold, while she had to raise the fund from which to pay it from the natives in silver. The result was that the natives of India had to pay something like twenty-five millions of rupees more than they had in 1874 in order to pay the fourteen millions gold to this country. There was no doubt, too, that the fall in the value of silver had entailed great hardship upon the military officers and civil servants who served in India. Several remedies were suggested by the Commission presided over by Lord Herschell, as to some of which there was a difference of opinion. Amongst them, however, was one as to which they were unanimous in approving. Silver had become now an ordinary product in the market of the world, and it had been suggested by those who were most interested in the subject that the removal of the present duty on silver plate in this country would have the result of increasing the demand, and increase the price in proportion. He urged upon the Government the beneficial effect this would have, not only upon the people of India, but also of this country. He advocated free trade in silver. Everyone knew that if you wanted a good piece of silver you went back to the time of Queen Anne to get it. The reason was obvious. Everyone knew that these restrictions injured our manufactories. He did not believe that the change he proposed would cause a loss to the revenue of more than £60,000 a year.

The Earl of Kimberly said that opinion on this subject was unanimous to an extraordinary degree. The present system which prevailed in this country was barbarous.

After some observations from Lord Stanley of Alderley,

Lord Herschell spoke in favour of the abolition of the duty. At all events he said it would be a change in the right direction. He knew there was a very strong feeling on the point in India. He trusted another year would not pass by without some alteration being made.

Viscount Cross almost entirely agreed with every word that had fallen from the noble Earl (Northbrook) opposite, and had, he said, hitherto done his best with the Chancellor of the Exchequer to induce him to take off this duty. He believed it practically brought in very little money. He was of opinion that it would benefit enormously India and also the people of this country. There was a strong feeling of grievance in the minds of the Indian people, which he thought should be eradicated. How far the abolition of the duty would benefit the manufacture in this country was quite another matter, but at all events it was a step in the right direction. The Chancellor of the Exchequer was, he knew, willing to make the change, but at what date he would be able to do so, he (the noble viscount) was, of course, unable to say, although he hoped the time would be not far distant.

The motion for the papers was agreed to.

"Duffing" Rings.

AN ingenious attempt to pass duffing rings, was brought before the Pawnbrokers' Protection Society lately. One afternoon a youth walked into the shop of a member of the Trade, and offered to pledge a diamond ring, and on being questioned as the owner, produced the following letter :—

"Ivy Villa, Adelaide Road,
"*July* 13, 1889.

"Sir,—About a week or so ago, when I pledged the enclosed, I borrowed a couple of sovereigns, having been taken queer rather suddenly, I am in a little pecuniary difficulty, if you could let me have an extra half sovereign I shall deem it a favour, if not, send £2 place money in envelope as I don't wish bearer to know how I am situated.

"Yours &c.,
"A Morton."

Upon being asked in what part of Adelaide Road, Ivy Villa was situated, he admitted that he had been sent by a man who was in waiting close by. The boy was detained, and presently two men came in and said they were dealers and had bought the ring at a well known firm of manufacturers who do a large business with pawnbrokers. A policeman was sent for but no charge was preferred against the men, one of whom, having got possession of the letter, quietly tore it to pieces. The proprietor of the shop, however, thought fit to reconstruct it. The ring was a single-stone diamond in common gold mount, worth from 20s. to 25s., and we understand that the same trick has been attempted in several quarters, it being stated that £2 had been lent before and that an extra 10s. is now required.

A correspondent, in sending the *Pawnbrokers' Gazette* another account of this practice, says—A dodge, which there is reason to believe has only been too successful, may perhaps be prevented from spreading further by this notice. Two young men appear to be engaged in the business, ages about 22 and 26. They present a note bearing an address in the neighbourhood—of which we append a copy—and offer a ring set with three small diamonds, which it is needless to say would be very dear at the price asked. This is a copy of one of the letters :—

"Sir,—The last occasion on which I pledged the enclosed I borrowed thirty shillings, having been taken queer rather suddenly, I am in a little pecuniary difficulty. If you could let me have an extra five shillings I shall deem it a favour. If not send 30s., place money in envelope, as I do not wish bearer to know how I am situated."

The Electrical and Industrial Exhibition at Birmingham.

THE Exhibition was opened by Lady Churchill, accompanied by her husband, Lord Randolph, on the day upon which our last number was published, so that from then till now is just a month, and still the places reserved for exhibitors are in some cases vacant. We took the trouble to find out who were the defaulters, and we discover that in almost every case the absentee is a Londoner. This is not as it should be. People who propose to exhibit should either do so or relinquish the space so that it might be filled up in another way. With this exception and the electric railway on the Telpher system, which seems as though it would never be completed, the exhibition goes right merrily.

Bands play every afternoon and evening. There are frequent organ recitals, and vocal concerts twice a week. There is an Egyptian mystery, and a coal mine which is no mystery at all. The Egyptian mystery was very nearly burnt up the other day, but fortunately Mr. E. L. Joseph had fitted up one of Mr. Julius Sax's electric fire alarms, which promptly summoned the firemen in attendance, under whose directions the flames were quickly subdued.

Electrically the Exhibition is considered a great success, and I hear that several good lines of business have been done since its opening. Industrially, too, the Exhibition may be pronounced interesting, and there are a number of exhibits which are of interest to readers of this journal.

Messrs. Swinden and Sons, Birmingham have one of the best exhibits in the whole of the Exhibition, and they have, what most of the *Industrial* exhibitors have *not*, the electric light and the telephone in their stand, which is as it should be in an electrical exhibition. They indeed have their reward, for in the evening their beautifully arranged show is one of the most attractive in the main avenue, which leads from the entrance to the gallery in which are situated the organ and band-stand. Their general exhibits include adjusted and other high-class watches, non-magnetic or current-resisting watches, English, Waltham, and Swiss, which go the even tenour of their way, despite the fact that below them, above them, and on either side of them, electricity is ever circulating. Waltham watches in gold and silver cases—plain, engraved, and enamelled. Antique long-cased English clocks in carved oak and other cases. English timepieces in ebony and inlaid ebony, and chime clocks. British United Co.'s lever timepieces and alarms, and a fine show of tools and lathes (including Boley's). Among the specialities shown are the Factory Clock, by which all the clocks and watches in the building are regulated, and which is so placed that it may be seen from the band-stand and fountain. It has a double dial and dead-beat escapement, and wood rod pendulum. An electric watch alarum, which also acts as a call bell and is a really neat and ingenious little bit of construction. You decide what time you'll get up and then place your watch on the stand provided. When the appointed hour arrives, the bell rings for 90 seconds, unless the drowsy one gets out of bed and stops it. An exquisite little carriage clock in the form of a mediæval lantern in copper and steel is shown, which is really a beautiful article. The model of James Watt's beam engine is a clock and barometer and is interesting. There are besides, watchmen's clocks and detectives' watches which indicate six stations. Ships' chronometers and Swiss records recording up to 24 hours. The firm also exhibit Messrs. Martineau and Smith's campanels, which are discs of metal, emitting, when struck, sounds both pure and sweet. They are used as dinner gongs. Altogether Messrs. Swinden and Sons have arranged a most interesting as well as an artistic exhibit, and if only to see this thoroughly a visit to the Exhibition is very well worth one's while.

Messrs. G. and F. Wattis, Birmingham.—This firm have one of the largest and best displayed shows in the whole of the Hall. It is also one of the most attractive to the general sightseer, as there are many novelties in mechanical toys which are really wonderful in their ingenuity. The piping bullfinch and other singing birds, as well as the new symphonium, which plays an unlimited number of tunes automatically, are among the most interesting things. There are also shown English and foreign clocks and watches, including English china clocks, French marble clocks, French drawing-room clocks, mechanical clocks in action, electrically illuminated clocks, and regulators for entrance halls. English, Swiss and American watches, and the non-magnetic watch. Aneroid barometers for all purposes, including pocket aneroids with scales for measuring height of mountains, etc., opera, field and marine glasses, and presentation cases of plate, etc.

Messrs. G. E. Walton and Co., Birmingham, have a beautiful show case erected in the central avenue, which contains some of the prettiest goods to be seen anywhere in the Exhibition. In the case may be seen gold and silver chains, pearl solitaires, as well as solitaires in gold and silver, studs and sleeve links. Mosaic jewellery, including brooches, bracelets and earrings. Photograph frames in considerable variety, and of very charming design. Likewise clocks and watch stands of similar make, watch keys of endless variety, pencil cases, scarf rings, and a miscellaneous assortment, considerable in extent, of filigree goods.

Messrs. Levetus Bros., Birmingham, have a nice display of well-looking cheap jewellery in Canadian gold and oxidised silver, including watch guards and alberts, ladies' belts, and some very pretty things in scent bottles.

Mr. S. Gorer, 433, Strand, London, has a stand in the central avenue, on which he displays a variety of articles manufactured from the patent Argosy silver. This material is not plated, but is a white metal all through. It does not tarnish or taste, nor become attacked by verdigris. It can be cleaned with whitening, and on the table has as good an appearance as electro-plate, and, of course, lasts longer. The price is very low, and the material is used for all the usual patterns of spoons and forks, including Fiddle, Old English, Shell, Balmoral, etc. Fitted chests of articles made of Argosy silver, including table and dessert knives and forks, table, dessert, tea and egg spoons, soup and sauce ladles, pickle forks, jam, salt, and mustard spoons, etc., are sold as low as seven guineas. It is claimed by the owners of the patent that Argosy silver is the best alloy of its kind, as the principal ingredient in its composition, contains in its natural state seven-and-a-half per cent. of real silver, and it thus contains more silver than ordinary plated articles and is enabled to resist oxydisation. On this stand is also displayed Fidler's patent pickle fork, and a very useful article, the "serviette suspender."

Messrs. J. E. Hartley and Co., Birmingham, exhibit dynamos, solutions, vats, and all electro-plate chemicals and other requisites. Polishing lathes, bobs, compos, calico, felt, and leather, mops and brushes. Also celluloid varnish or lacquer kristaline, and various articles coated with same. Also a new composition for insulating electric machines, and the whole process of electro-plating.

Messrs. W. Canning and Co., Birmingham, also exhibit complete plating plant, and all the chemicals and drysalteries, oils, &c., used in the various process.

Mr. Richard Cruickshank, Birmingham, has a similar show to those of Messrs. Hartley and Messrs. Canning.

Messrs. Henry Jenkins and Son, Birmingham, have an exhibit including a medal press at work, striking interesting medals in commemoration of the Exhibition, which are of artistic merit and well worth possessing. Stamps and presses are also at work, showing the processes of metal stamping. There are some framed patterns showing designs of checks, tokens, labels and ornaments, and show-cases containing badges, stars, &c.; military and naval officers' miniature medals, army and navy decorations and other medals. Also a valuable collection of war medals dating from 1799 to 1877.

There are of course many exhibits of great importance to everyone who takes an interest in the progress of our manufactures, but space can hardly be found in this journal for the adequate treatment which such exhibits would deserve and demand. In our notice we have endeavoured briefly to describe exhibits which would be most likely to interest the watchmaker, jeweller, and silversmith.

Jewellery in the Paris Exhibition.

Notes by a Birmingham Jeweller in the *Birmingham Daily Post.*

WHEN we begin to examine the best work in the Austrian Court, we find ourselves carried back to the arts of the Middle Ages. Böhm, of Vienna, indeed, counts it his chief glory to give perfect reproductions of grand mediæval pieces, rich with gems and enamel of many colours, while even his modern specimens of the goldsmith's and jeweller's art are so quaint and old-world in time and feeling that they must have all the charm of heirlooms in wear. They are quite free from that suspicion of extreme newness which, although highly prized by the *nouveaux riches*, is so little in vogue in good society; and would, indeed, almost give to the latest aspirant to fashion the air of a descendant from a family of quite respectable antiquity. There is a disadvantage in this. I saw more than one piece in that remarkable collection which bore most suspicious resemblance to veritable antiques in the cabinets of friends in England; and when on enquiry as to one well-remembered specimen, I learned that seven or eight copies had been made, my heart sank within me in pondering on the hard fate of some of our art connoisseurs. Still, setting aside the iniquities of which even dealers in curios may be capable, the works in this exhibit are of signal excellence, and deserve careful study. In the post of honour is the famous "Ship of Baptism"—a mediæval vessel, in full sail, enamelled within and without, with a large and varied crew, most perfectly modelled and wrought—a symbolic gift in the middle ages on the occasion of the baptism of a notable child, and evidently referring to the saving by water of Noah and his family, to Peter the fisherman, and involving the wish of the donor, which has passed into a proverb, that the recipient may pursue successfully the voyage of life. The copy of the Austrian sceptre is rather overloaded with ornament, though beautiful in detail; while timepiece, monstrance, crozier, mirror, and jewel testify to the richness and variety which the Austrian jeweller can bring to bear in his favourite scheme of vari-coloured enamel and gems. The effect is gorgeous without being barbaric, as the harmonies of colour are well preserved; but the style is not likely to become English, and I can hardly wish that it should. Egger frères, of Budapesth, while echoing the same style, introduce to us the Hungarian opal, a lately neglected gem, which is deservedly coming again into favour. Some of their examples, displaying as *fischu* brooches the opal in its native matrix, with little gnomes in gold and silver engaged in quarrying or cutting it, were positively amusing. The attendant however, explained in a deprecating manner that these were for "export!" I fear, also, that gilt scarfpins, set with stones, at a wholesale price of three francs the gross, were also for export; and the patterns gave rise to a shrewd suspicion that large quantities of them come much nearer home than wholesale jewellers would care to admit.

Crossing to Belgium—not a long journey in this Exhibition—we come to the superb diamond-cutting by Latrine, of Antwerp. Besides perfect series of stones, he has crosses in four pieces, joined together with admirable art. I should not forget in this connection the large building near the Tour Eiffel where Mr. Boas, of Amsterdam, shows the process of cutting diamonds in both the old and the new style in a most complete and instructive manner.

We come now to Italy. It is some 70 years since Lord Byron cried :—

> Italia ! O Italia ! Thou who hast
> The fatal gift of beauty ;

but it would appear to-day that the beauty of her wares is only fatal to the purses of those who come within the range of their charms at these exhibitions. It is probable that in few parts of the great show is there a more lively business done than in the Italian section. Always pretty, always the same, with a certain flavour of antiquity about them, frequently being copies of ancient examples—whether mosaic, cameo, coral, or goldsmith's work—there is always something which appeals powerfully to visitors, who would not even look at similar specimens in their own country. Their most ancient patterns, like the deities of old Rome, appear to enjoy the freshness of eternal youth. We must allow that the best of the pieces themselves are extremely beautiful, and amazing in patient detail. But the prices which these Italian goldsmiths can obtain from English and American buyers for these reproductions of archæological examples are such as would make the most aristocratic retailer at the West End turn pale with envy unless he were the most disinterested of mortals. Castellani indeed, the prince of goldsmiths and high figures, is not there, but his spirit survives. It was certainly to his genius and taste that Italy owed the great revival of the goldsmith's art in her midst, and it must be conceded that it was the superior excellence and purity of style which the late Signor Castellani introduced in his work which gave it a value, like that of pictures by an artist in high repute, far above the ordinary market price of so much capable labour. Melillo, who follows in his footsteps, has some superb specimens, but with little novelty or originality ; and after a while we begin to tire of the endless labour of placing together tiny beads of gold on a surface, so close together that it has the effect to the unpractised eye of a roughly-chased groundwork only. The taste is good, the copies are exact, and people continue to buy them. Fusoli, Villa Benvenuto, and others follow in the same direction, with general excellence of detail. Francati is there as usual, with pieces of work in cameo and coral carving—superb suites of coral and diamond work, which show that the pale pink branch from the depths of the ocean is still a power in the matter of personal ornament. These, indeed, are only a few names among a host of exhibitors all eminent in their line, and apparently all having a distinct fascination for the wealthy visitors.

Spain still maintains in its exhibits that delightful art of gold damascened upon iron which seems its sole living heritage from the Moors of the Middle Ages. Endless arabesques in the style of the Alhambra appear in mirrors, tazzi, brooches, bracelets, belts, and every variety of personal ornament. There is a new feature—the iron cameo, set in gold. This is a fine argument in favour of the more useful metal, to see it carved with the visage of an African or a Roman Emperor, and adorned with a charming gold border, which gives it all the richness of a gem. But, surely, one would have thought the glorification of iron should have come from Birmingham rather than from the orange groves of Spain. Singularly enough the leading jeweller of Madrid names with pride a number of English art connoisseurs who are the leading purchasers of his productions.

I fear we must class in the same category as artists in reproduction the famous Christesen, of Copenhagen, and his brother goldsmiths from Denmark. His exhibit at Vienna in 1873 was almost a revelation of the wealth of beautiful ornament, chiefly Scandinavian, which had lain for centuries in the museums of the North practically unnoticed, but which his archæological knowledge and technical skill had enabled him to translate into living realities. The torques and bracelets, the wonderful volutes and interlaced patterns, the quaint but appropriate forms, the gold wire and cord decoration, so like the work of the ancient Etruscans in patient detail, yet so different in style and character—all these, suddenly brought again to light in a perfect series of modern jewels, fairly took the world by storm. They were not merely a fashion, they became the rage. Unhappily, the historic genius has not in this instance become prophetic. The Danish goldsmith has been able to reproduce an ancient style, but when the popular interest in it had burnt out he was not able to evolve a new one from its ashes. The continuous copying of Scandinavian examples is not enough. In the end it becomes wearisome, and we long for some new motive to give interest and vitality to the ornament. The work is still superb; to those who see it for the first time it has an inexpressible charm, but seen too often we fly for relief to styles probably less pure in themselves, but admitting of greater variety in expression.

If we require novelty we can perhaps hardly find it better afforded us than in the exhibit of Tiffany and Co., which is the glory of the United States section. I have referred to it before in speaking of the orchid ; but the large pieces are all marked by an intense and almost painful striving after something new. The gems used—setting aside the diamond, which makes its presence felt everywhere—are strange and often rare. While everything speaks of the great wealth of expected customers, there is rather too much weight and solidity of treatment to meet the views of Paris jewellers, to whose style as I have said before, this class of work is otherwise nearly related. The wonderful dress-front of diamonds, almost fabulous in value, illustrates this. It reminds one of the owner of the walking-cane with a remarkable new stone set in the head, who, on showing it to Mr. Vanderbilt as a curiosity, is said to have been met with the remark, "Ah, yes. I have a mantel-piece of the same material at home."

Switzerland, though last on our list, should not be the least in our estimation, for the specimens exhibited, especially in the class of enamels, are of rare excellence. The jewellery is always good, sometimes tending to the English, often to French styles. But the practice of enamelling has become a fine art with the Swiss jeweller. The decoration of watch backs has led him to concentrate his attention upon a small surface, and this has given him a geometric scheme of colouring, concentral and cumulative, which affords the happiest results. The combination of dead surface enamels of low tones with brightly fused colours, which thus shine out like gems by contrast, is as remarkable for beauty as it is great in technique. But if we wish to know the reason why Switzerland stands out thus prominently, we must go again to that part of the Exhibition devoted to the liberal arts and examine the display from the Ecole des Arts Industriel de Genève. There we shall see the means and the process of that sound teaching of industrial design which is the only road to permanent excellence and real success in the arts of the goldsmith and jeweller.

Having briefly scanned the leading features of one class of exhibits in the most remarkable Exhibition the world has yet seen, I must acknowledge the general candour and fairness of the French mind towards the good qualities of pieces of foreign manufacture which are yet alien to their own genius and temper. Proud of the magnificent achievements and artistic displays of their own people, which are naturally most abundant in the home of the Exhibition itself, they are fully disposed to learn the lessons of the great show which each nation has in its power to convey. The typical Paris jeweller is an earnest, thoughtful, practical man, very hard-working, and with an observant eye for artistic detail, which is the main source of his position in his craft. He is sympathetic and appreciative to a degree. While thoroughly French in his tastes and sympathies, with a curious sensitiveness as to any national or insular prejudices which may be lurking in the mind of a foreign visitor ; once relieved upon that score, he becomes most charming and unreserved. Among my most pleasant recollections will ever be that of a sporting banquet at the Café Brétant, on the first stage of the Eiffel, where a company of jewellers, brothers in aims, although of another nationality, generously received one's first public effort in a foreign tongue with three excellent attempts at a genuine British "Hurrah!" The *entente cordiale*, which has become a phrase in politics, is more likely to be a reality in the sincere pursuit of industrial art, which proves to men in earnest how much they have in common. Not to moralise, I only hope that the few hints offered may be useful to those who have yet to go to Paris, satisfied as I am that there is much in the jewellery and goldsmiths' work at the Exhibition well worth the attention not only of the manufacturer, but of the public at large.

The Co-operative Exhibition at the Crystal Palace.

THE competitive display in watchmaking is exceedingly small and clocks are not to be seen. In the former, Mr. Jabez Jackson, of Coventry, makes a fair show consisting of drawings, an interesting collection of escapements, illustrating the gradual progressive stages from the verge escapement upwards, and some useful original improvements in tools for interchangeable escapement making.

Mr. P. B. North has two well-finished cased watches, and Mr. J. Tansley exhibits a finished fusee piece, pivot and shoulder of arbor to a $\frac{3}{4}$-plate movement. In this section Mr. Jackson has obtained the first prize and Mr. North the second.

The London and Coventry Watchmakers' Association have mixed exhibits in the "productive department," consisting of clocks, watches and jewellery; they are not for competition.

The Polytechnic have extensive and varied exhibits under the heading of "Special Section," and one of their sub-divisions is devoted to their School of Watch and Clockmaking. The articles here shown are tuitional appliances, workshop appliances, and work of students. The former consist of models of escapements and depthing, both for demonstrating the general principles, as well as the effect of the chief errors to which these sections of time keepers are liable. It includes also a large model of parabolic pendulum, with a diagram and explanation of its principle. The workshop appliances consist of some special tools and instruments which are used at this school for practically setting out calibres of clocks and watches, and for making escapements, and are exclusively the design of the principal teacher, (Mr. J. Herrmann). The work of students consists of parts of clocks and watches, a turret timepiece and compensation pendulum, a bracket clock, regulator train and deadbeat-escapement, keyless $\frac{3}{4}$-plate lever, &c., and some tools made by students. The case contains also a considerable number of coloured and shaded drawings of escapements and complicated watches, including a drawing of a keyless minute repeater, with independent centre seconds, in the execution of which very little can be suggested in the way of improvement.

The awards in this section consist of a silver medal to the School, a bronze medal to the Instructor (Mr. Herrmann), three bronze medals to students, one first class certificate, three second, and three third class.

The Ladies of France and their Diamonds.

TAKING stock of other people's wealth is always an interesting process to the generality of mankind, whether wealth consists in cattle and sheep, as in the days of Moses, or in diamonds, as in the Eiffel Tower age.

The "nouveaux riches" of America can boast, with some show of justice, that they possess, if not the rarest of diamonds, certainly the greatest quantity.

In spite of the war indemnity of five milliards, France is not beggared yet. Mademoiselle Dosne, sister-in-law of the late M. Thiers, possesses diamonds valued at one-and-a-half millions of francs. Madame Thiers, her sister, bequeathed to the nation a diamond necklace worth 100,000 francs, which lies on view, together with many other valuables, tabatières, miniatures inlaid with jewels, etc., in the Museum Thiers, at the Louvre.

The Duchesse d'Uzés, the most powerful and fascinating woman in France and the friend of General Boulanger, wears a necklace composed of old Brazilians, "vieille roche," of the estimated value of over a million.

The Duchesse Droudeville and the Comtesse de Pourtalès possess some of the most perfect and beautiful diamonds in France.

Madame Henry Say has a necklace of black and white pearls, costing 300,000 francs; and the Duchesse de Mouchy owns the most valuable emeralds.

This list is simply an extract from the great catalogue of French ladies whose diamonds are famous; it could be indefinitely prolonged.

Defective Sight and its Optical Correction.*

By W. D. Mason, A.P.S.

(Continued from page 40).

MYOPIA.

THE term myopia is derived from the Greek, and signifies to nip the eyelids together.

Myopic persons are short-sighted, and generally half close their eyes when looking at distant objects, to exclude all but the central rays, and so obtain slightly clearer vision.

In the old text-books on optics, short sight was said to proceed from too great convexity of the cornea, that is, that the central and front portion of the eye projected too much. But more recent researches have completely disproved this theory.

All ordinary myopic eyes are too long, as a whole, from front to back, from the cornea to the retina, so that parallel rays from distant objects are brought to a focus, not upon the retina, but before they reach it, and then cross over, forming an indistinct image called a diffusion patch, instead of a clearly-defined one. But for near objects the rays from which diverge the myopic eye is already adjusted partially or wholly, according to the extent of the affection.

The myopic eye when at rest, is not adjusted for infinite distance, like the normal eye, but for a certain definite far point, which may be three inches in high grades of short sight, or may be twenty or forty inches in lower degrees of the defect.

Such eyes can exercise accommodation, though often not to the same extent as normal eyes. The short-sighted can adjust their eyes for objects nearer than their far point, but not for those further off.

Everything beyond that point appears more or less indistinct, or altogether invisible, according to the distance of the object looked at, or in many cases looked for, and the degree of the myopia.

Short sight is itself not supposed to be hereditary, but a predisposition to it is often inherited, and then the same causes which produced it in the parent will produce it in the child, unless special precautions are taken to guard against it.

Short sight is brought on by too great a degree of convergence for prolonged periods in exercising the eyes on near work. In young and tender eyes, especially such as have an inherited tenderness, a high degree of convergence has a tendency to stretch the eye out of shape, so that the axis of the eye, an imaginary line drawn through the centre of the eye from the front to the back of the globe, becomes too long, and no longer coincides with the focal length of the lens and other refractory media.

Now we have already seen that convergence and accommodation generally go together. It therefore follows that a short-sighted person, holding his book very close, and whose eyes are converging to an unnatural degree, will often instinctively call into play his accommodation to relieve the strain. But such a course will again render the type indistinct, and it must be brought nearer still, which increases the convergence, and with it the myopia.

To put the matter more plainly, a short-sighted person holds his book much too close, and the closer he holds his book, in most cases, the more short-sighted he becomes, and the more short-sighted he becomes the closer he will hold his book, and so he goes on from bad to worse until driven either to seek the assistance he requires, or until the retina becomes detached and he loses his sight altogether.

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The remedy for this distressing and dangerous state of affairs is the use of proper concave glasses which will give to the rays of light sufficient divergence before they reach the eye, to cause them to come to a focus further back than they otherwise would do and form a distinct image on the retina without undue approximation of the object.

A person whose near point was twelve inches away could see perfectly at that distance, and by the exercise of accommodation could see still nearer. But with a concave lens which would diverge parallel rays from distant objects to the same degree as if they came from a point only twelve inches away, he could see perfectly well in the distance. By using sufficient accommodation to overcome the lens he could also see near objects, and his eye would be to all intents and purposes as good as a normal one. But it often happens that for want of exercise the accommodation of myopic eyes is deficient. When such is the case lenses which are the best for distance cannot be worn for reading or writing, and weaker ones must be used for near work than for distance.

Many short-sighted persons will be greatly surprised to learn that it is of far more importance to use glasses for near work than for distance. It does not matter much so far as regards the preservation of their sight whether such persons use glasses for distance or not, but they are generally willing to do so because they cannot see much without them. So long, however, as they can see to read small print or do fine work close to their eyes, they think no lenses are required for such purposes.

There is also a mistaken notion that short-sighted eyes are good and strong because they can often see smaller objects and in a dimmer light than ordinary eyes. In fact they can do without convex lenses what ordinary eyes can do with them. But this simply arises from the approximation of the object. The amount of light varies inversely according to the square of the distance from its source or from which it is reflected. When viewing objects twice as near as other people you get four times more light, three times as near, nine times more light, and so on.

It cannot be too much insisted upon that short sighted people do not wear glasses for near purposes so much to make them see better as to make them see further off and to relieve the strain on the convergence muscles. This strain, if long continued, will sometimes produce squint, double vision, giddiness, sickness and serious illness.

In low or moderate degrees of myopia all that is necessary is to find the exact focus of the concave lenses best adapted for distant vision and then to wear them constantly for all purposes. But in high grades the amount of accommodation must be carefully estimated and, as a rule, different powers must be prescribed for different purposes.

When suited with spectacles myopic persons should be careful not to read without them, to hold the book at least twelve, and if possible fifteen, inches away, and not to get into their old bad habit of holding it close. Also to sit erect and not bend over their book or writing, as a stooping position is not only unhealthy but causes a flow of blood to the eyes and has a tendency to aggravate the condition.

HYPERMETROPIA.

Hypermetropia, or true long sight, is exactly opposite to myopia in every respect.

It is that condition of vision in which the axis of the eye-ball, measured from front to back, is too short. The eye is too flat at the back, and consequently parallel rays proceeding from distant objects are not brought to a focus on the retina when the accommodation is at rest, but such rays reach the retina before being brought to a focus, and a diffusion patch is formed instead of a distinct image, not by rays which have met and crossed over as in myopia, but by rays which have not come to a focus at all, and would do so, if possible, at a point behind the retina altogether.

Like other eyes, hypermetropic eyes possess the power of accommodation, and, in order to obtain clear vision of distant objects, they are compelled to use this accommodation or a portion of it to bring the rays to an earlier focus to correspond with the short distance between the cornea and the retina.

By using their accommodation for distance, hypermetropic eyes are left with a deficiency for near purposes, and are scarcely ever at rest except during sleep, or when closed, or in darkness.

Although the power of accommodation is generally strong in such eyes from much exercise, it is, in all but slight cases, insufficient to meet the demands made upon it after the period of childhood, and in consequence of the strain on the muscles which adjust the crystalline lens never being relaxed, smarting and inflammation of the eyes, headache, and inability to read or write for long periods, are the symptoms usually complained of. These symptoms are often attributed to weak sight, but in most cases are indicative of hypermetropia.

This condition of vision is often hereditary, and, unlike myopia, is never acquired, but always exists from birth.

Convex glasses of sufficient power to bring the parallel rays of light to a focus on the retina, the eye remaining passive, are used for the relief of hypermetropia. These lenses restore the eye to the condition of a normal one for distant vision, and set free the accommodation for near work. In many cases, however, where the eyes are deficient in their power of adjustment, especially as the patient grows older, a second and much stronger pair will be required for near purposes.

The prescribed glasses should be worn constantly, and only taken off to be exchanged for the reading glasses when two pairs are used.

Cases of hypermetropia are often complicated by what is known as spasm or cramp of the accommodation. The eye has become so accustomed, in its craving for distinct vision, to make an unconscious strain on the muscles of accommodation, that, when the proper convex lens is placed before it, these muscles do not relax, and the eye utterly refuses to recognise the lens as an improvement, and sees worse instead of better.

In other cases only a portion of the accommodation can be laid aside, and the eye accepts as the best, a lens much weaker than the one required for complete correction.

High grades of hypermetropia are sometimes mistaken for myopia when the eye, never having been accustomed to clear vision at any distance, prefers a large image to a distinct one, and so the object is placed close to the face as in short sight.

At other times when the affection is moderate and the accommodation, being strong, has passed into a state of unnatural tension, apparent myopia is produced by over-correction of the defect, and a weak concave lens is preferred.

To clear away these complications it is customary to use atropine, an alkaloid prepared from belladonna.

This drug, when applied to the eye, not only has the well-known effect of dilating the pupil, but it also temporarily paralyses the muscles of accommodation, so that the eye is brought to a state of complete passiveness, and its refraction can be accurately determined.

The application, when made under proper restrictions, is quite painless and free from danger, but, it is only right to add, that, by suspending the power of accommodation for a few days, it causes dimness of sight and inability to define near objects in all but short-sighted subjects.

These effects, however, speedily pass away and leave the eye in its former state.

Hypermetropia is, then, divided into the "manifest," or that which was apparent before the use of atropine, the "latent," or additional degree brought to light by the atropine, and the "total," or whole amount of hypermetropia discoverable.

The total hypermetropia should be corrected as soon as possible, for the greatest relief will then be experienced, but it must often be done in two or three stages to gradually accustom the eyes to the required power, and in some cases, the use of the atropine in a greatly diluted form must be continued for a short time.

Atropine is also useful in myopia when complicated with spasm of accommodation, which makes the defect appear much greater than it really is. It should always be used in testing young persons for astigmatism, or any difficult form of defective sight.

(To be continued.)

A Desideratum for Opticians.

It will be remembered by readers of this journal that in March and April last we published articles entitled "Practical Hints on Optics for Skilled Opticians," and in the June number of the journal a letter from Mr. Louis Courlander, of Croydon, drew attention to these articles, and, while referring to their value, said that what he should like to have seen was a series of articles on the science of Optics, as opticians generally had but a vague idea of what they were doing when selling a pair of spectacles. It is perhaps true, as Mr. Courlander conjectures, that 95 per cent. of shopkeepers who sell spectacles do so in a haphazard fashion, which must necessarily be very injurious to those whose eyesight is weak or failing and who resort to such a method of prevention or cure.

As the optical trade is at present situated—when opticians sell clocks, watches, jewellery, electro-plate and fancy articles, it would be entirely impossible for one in such a trade to be a professional oculist, and it therefore becomes apparent that what cannot be done in one way must be done in another. If the shopkeeper cannot go to science; science must come to the shopkeeper. Is this possible? Until the present time science has given no indication of any willingness on her part to help the optician; but, as if to answer the letter of Mr. Courlander, a well-known and prominent manufacturer in Birmingham has recently patented a novel instrument which will do all for the optician which his faulty knowledge requires, and will reduce very considerably the labour and painstaking care which has always been so necessary in connection with the correct fitting of a pair of spectacles, even to one who was thoroughly acquainted with his business.

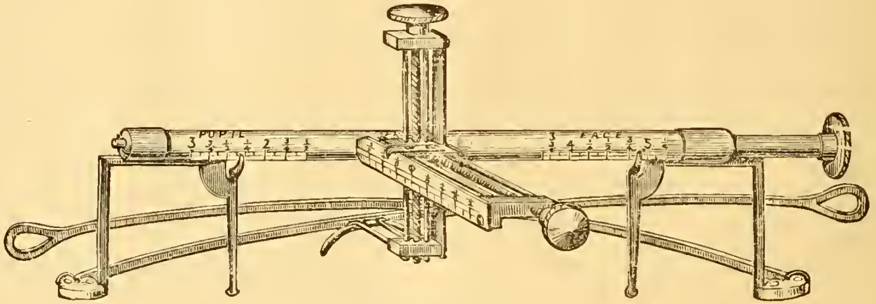
The invention of which we speak is the "Faciometer," the "letters patent" of which have just been received by the inventor. The necessity for such an instrument has long been recognised by oculists and opticians and by all, in fact, who have had anything to do with the adaptation of spectacles. In order to obtain the best results, the spectacle frame should fit *exactly* the face of the wearer as well as contain the necessary lenses.

Hitherto, in consequence of there being no ready means for this purpose, the greatest difficulty, even with skilled oculists and ophthalmic surgeons, has been experienced in obtaining even *proximate* admeasurements of the face—an ordinary rule being frequently used, and more often than not the dimensions are merely guessed. There is very little difficulty therefore in realising the fact that the spectacle-maker, although able to manufacture a perfectly-fitting frame if the correct dimensions are given, often fails to turn out a pair of spectacles of the exact size and shape required, owing entirely to the inaccuracy of measurements given him.

These difficulties are entirely overcome by the "Faciometer," as by its use the necessary admeasurements can be accurately and easily ascertained. The admeasurements are:—*(a)* The facial breadth,—*i.e.*, the width of the face, or the distance between the temples; *(b)* the pupillary distance; and (a special feature of the invention) the exact position of the bridge of the nose, both as regards (1st) prominence, and (2nd) distance from centre. All this is accomplished by the one instrument by means of a number of small milled-head screws, turned by the thumb and finger.

In construction the "Faciometer" is at once very simple and very complex. The parts are simple, but their movements are complex. It consists of a metal tube through the whole length of which a screw runs, terminating at one extremity with a milled-head screw, and threaded from the centre in opposite directions. Inside the tube and on either side of its centre are two small metal barrels, to which are attached two pairs of pointers. These barrels are threaded to correspond with the screw running through the tube, with the result that on turning the milled-head a simultaneous right and left movement of the pointers is obtained. Further description would, without diagrams, lead to confusion, but the rest of the movements in this most ingenious contrivance are accomplished in a similarly simple manner. There are four graduated and numbered scales, and when the instrument comfortably fits the face of the patient after the adjustment of the various screws, the different readings of the four scales have simply to be written down, and, working upon these exact measurements, the manufacturer will have no difficulty in making a pair of spectacles which will perfectly fit.

The "Faciometer" is neat in appearance, durable and light, and all the admeasurements can be taken and ascertained *exactly* BY SCALE without removing the instrument from the face of the patient. The many advantages of the "Faciometer" will be obvious to everyone, and the opinion of professional oculists is that "it supplies a long-felt want."



THE "FACIOMETER."

When it is realised how necessary it is that the eye should be properly cared for, it becomes apparent how important this new invention is. The days when chemists drew teeth have passed away, and a dentist has established himself in every place. Specialists for the throat and for the ear are to be found in all large towns; it is only the most delicate organ in the body—the eye—which has been so sadly neglected. This state of things may now be obviated by the use of the "Faciometer," and each of the "10,000 spectacle-sellers," of whom Mr. Courlander speaks, should undoubtedly possess themselves of an instrument so very effective and useful and at the same time so cheap. The "Faciometer" is supplied in a neat leather case, together with "Hook Rule" for taking the measurement for the sides, at 25s. each, by all wholesale opticians. W. K. P.

Standard Gold.—In Committee on the Light Gold Coinage Bill, Mr. Goschen proposes to have the standard weight of the sovereign fixed at 123·27447 grains, and the standard weight of the half-sovereign at 61·63723 grains.

Studying Heated Metal.—A French microscopist has made a new application of photography. Being unable otherwise to examine the structure of heated steel, he photographed the white hot metal, and then placed the negative under a microscope.

The French Crown Jewels.

UNDER the title, "The History of the Crown Jewels," M. Bapst publishes in the *Moniteur de la bijouterie et de L'Hologerie* an account of these jewels, and of their distinguished wearers from time to time, from which we extract the following.

Eleanor of Austria, wife of Francis I., was accustomed to adorn herself with the crown jewels at all important ceremonies. She wore a large collar composed of eleven diamonds set in festoons of necklaces. Each diamond was separated by two consecutive knots ornamented with pearls; the clasp consisted of a knot likewise enriched with pearls. Under her reign collars were very large; they were displayed over the breast and shoulders. Upon the sleeves, then very large, were placed thousands of stones mounted upon bezels. The corsage was fastened by a girdle ornamented with little stones of which the two extremities descended to the bottom of the petticoat, ending in a jewel composed of a large hanging brilliant of three pearls. These fashions suffered few modifications until the end of the seventeenth century. In 1725, on the day of her marriage, Marie Leczinska wore a large cloak of violet-coloured silk velvet, thinly sown with *fleur-de-lis* of gold and numerous little stones. The front of the petticoat was overloaded with diamonds and the sleeves covered with *agrafes* in jewellery. She wore around her neck a collar, called the iron collar, mounted in diamonds appliqued over velvet. In the centre was suspended the Sancy, and her coiffure was adorned with the Regent. At this epoch jewellery suffered a profound revolution greatly to its own advantage. Stones until then mounted with heavy settings of enamel were henceforth mounted plainly, giving greater effect and lightness to the jewel. We do not know to whom to attribute this innovation, but the two jewellers of the crown, Rondé and Jacquemin, and the four jewellers of the king, Lempereur, Leblanc, Stras and Georges-Michel Bapst, were not foreigners. The diadem was not at first worn; the head-dress was decorated with *aigrettes* in the form of spindles, bouquets, flowers, branches or knots of ribbons. On the ears were worn girandoles, that is to say, a stone mounted in bezel to which, by divers motifs, were attached three stones suspended equally over the bezel. This fashion had not changed since Louis XIV ; it was later, under Louis XVI, that the custom of wearing different earrings, and in particular a single pendant, was established. Sometimes the bezels were replaced by a mass of little stones which took their form. On the neck were worn collars, the middle of which was generally formed of a large knot with one or several pendants ; the two parts which separated at the centre were closed behind the nape of the neck, and were called arches ; they were often as large as the knot and would measure two-thirds of an inch. Often, also, the central motif of the collar supported one or two little clusters of stones, to which were attached one or three pendants. The ornamentation of the robe was very complicated. At first over the corsage, in the form of a long triangle with a high base, was placed a jewel called the body-piece. This was a succession of knots more or less large according as their place was more or less elevated upon the corsage, and which were placed following their form the one above the other, the smaller at the girdle and the larger at the border of the robe, thus covering the whole front of the corsage. Upon the shoulders were worn knots, called shoulder-knots ; this was often in the shape of an acorn, which hung from a diamond buckle or a simple cluster of stones. At the girdle was a long row of stones terminating in the point in front and which took the name of edges. The edges formed four separate pieces ; two intended to be worn in front, two behind.

On the sleeves, almost always of lace, were placed a kind of pompons composed of a diamond in the centre with several diamonds around it. The train of these pompons was called *crevée*, and this name was derived from the sixteenth century custom of placing pompons at the extremity of each seam. At the side of these pompons were placed compeer buttons, that is to say, the pompons were intended to cover the robe with gold lace in all places which it was thought necessary to render brilliant. Bracelets were worn as now ; they were in the form of a plaque, often a portrait surrounded with brilliants and attached to several rows of pearls ; there were bracelets of less value and more appreciated made from the hair of beloved persons. The robe, with its enormous panniers, was sustained at both sides by agrafes in brilliants of different forms, but generally of a band of diamonds with two crochets at the extremities. They were called side trusses. A similar agrafe supported the queue ; it was very large and called queue-truss. The side-trusses and the queue-trusses were worn sometimes in the shape of a knot. Thus was composed the exact suite of a grand jewellery adornment. But outside of these jewels there existed all the forms of ordinary jewellery. The original decoration of the bonnet consisted of diamond head ribbons, which were placed upon the bonnet ; there were also topknots, knots or beaks ; they were little motifs adapted to the extremity of the point of the bonnet at the elevation of the front. Neck ribbons and ribbons for dressing gowns were ornamented with agrafes ; shoe-buckles and in fine, chatelains, fans, etc., completed the series of the jewels of the period. At this time jewellery was at its apogee as to mounting and decorative effect ; under Louis XVI it lost its qualities. If from our time it has sought relief, it would be a grave wrong to be occupied especially in painting the eighteenth century, whilst it would be better to seek to discover in the nature and simple form something new, belonging to our period and our fashions. Marie Antoinette did not admire heavy jewels ; she answered the jeweller, Boehmer, who proposed to her the famous collar known later under the name of the "Queen's Collar : " "That France has much more need of a ship than of a cluster of diamonds."

In this connection, it is generally believed that this collar has some relation to the crown jewels; we sketch in two words the facts, and it is seen that the "Queen's Collar" has never formed a part of the treasure of the State. Boehmer, having to be the crown jeweller, had employed the greater part of his fortune (a sum of 1,600,000 livres), in composing a Bertha collar, which he offered to the Queen on several occasions, but which was always refused. An intriguante, Madame de la Motte, contrived to abuse the jeweller, and to persuade him that the collar so often refused was at last to be accepted, and she represented herself as the agent of Marie Antoinette. As soon as she became possessed of the jewel, she had it broken and the stones disappeared, probably sold in England. To persuade Boehmer that the Queen had bought the collar, Madame de la Motte was served by the Cardinal de Rohan, who played in this whole affair the role of a dupe or sharper, the distinction between which will probably never be known. When Boehmer demanded of the Queen payment for the collar, there was as much astonishment at his charge as at the manner in which it was received. The truth was soon discovered. A celebrated legal process took place, and drawn by a political course, the magistrates acquitted the Cardinal de Rohan by an arrest of judgment impartial history has deemed iniquitous. Following this fact, Boehmer and Bossange, ruined, offered for sale their charge as jewellers to the crown, which Paul-Nicholas Ménière bought toward the end of 1788. Marie Antoinette, in Grand Court Costume, did not wear the collar; her robe was not adorned with the enormous brooches which composed the front of Marie Leczinska's corsage; the girandoles of three pendants were more diminutive; she wore in her ears only a pear attached to a bezel. Aigrettes or ornamental motifs continued to be worn in the hair. Bracelets were multiplied: they were generally plaques composed of a coloured stone surrounded with diamonds fixed upon the upper part of the arm by strings of pearls. Numerous corsage bouquets were worn at friendly re-unions, and on the fingers such a multiplicity of rings as to be known as "Marquise rings." In respect of brooches, figures in interlaced diamonds were worn ; the whole, framed in garlands of laurel with knots of ribbons, bottom and top, and formed of little diamonds and roses. This was the type of the jewels of Louis XVI. A medallion of this order, with the figure of the King, and executed for the first time, it appears, for Marie Antoinette, was displayed at the exposition of the Salon of Correspondence in

1779. At the court, other ladies, who could not show a neck or shoulders like the queen, continued to cover themselves; they wore berthas or plastrons which extended over the breast and covered the border of the corsage; the type of these berthas, which adapted themselves to the neck by knots of ribbons and hung in garlands over the breast, is the collar called the "Queen's Collar." The diadem did not appear until later, towards 1788, and of diamonds only at the beginning of the nineteenth century; until that time it was worn mounted in chased gold, sometimes with cameos. Jewellery loses in mounting simplicity of lines; clusters have only for their end to present the stones in their brilliancy; the stone is considered as a matter which serves as the instrument to obtain an ornamental motif. It is the opposite of the design of jewellery. Jewellery serves to give the stone its value, the mounting is but a frame which presents under the fires of the rays of light the precious stone, which is the object to be seen. From the beginning of his reign, Louis XVI. gave Marie Antoinette two girandoles composed of two pears of brilliants pendant from four diamonds forming the attachment. She constantly wore these girandoles in her ears. To respond to its tastes of general simplicity, of sentimentality, which the new Heloise placed in fashion, almost all of the jewels of the women were unmounted, and stones over paper served for fêtes with a provisional mounting to adorn the costume of the queen. It came to pass that the objects of jewellery disappeared; rich ornaments no longer existed: the Regent, the Sancy, the Mazarins, the large stones of the crown were placed negligently either in the midst of an aigrette of heron plumes or as drops of water upon garlands of flowers.

American Items.

Sixteen hundred employees are said to be now on the pay rolls of the Dueber-Hampden Works, at Canton, Ohio.

The drift in New York gold jewellery fashions is towards enamel and fancy flower work, with diamond ornamentation.

To vary the monotony this season, the Case Makers in the Association (National Association of Jobbers) are, says the *Watch Dial*, now busily engaged in cutting each others' throats tearing and rending one another, much to the delight of the Western Association Movement Manufacturers; and if one could believe what each says of the other, he would certainly be convinced that there are no honest watch cases made for, or sold by, the Association jobber.

The Kilkenny Cat Fight now going on in New York amongst the Trust Filled Case Manufacturers, in which each seems to be trying how little gold they can put in a filled case, and how many years they will "guarantee" it to wear, is very amusing to see. Every day brings out a new brand of filled case or a change of name of an old one, and the amount of wind and blowing is astonishing to see. "When rogues fall out, etc."

The result of "rushing the season" is, according to a correspondent of the *Manufacturing Jeweler*, already making itself felt in a manner which, to say the least, is most unsatisfactory. For a term of three or four weeks trade was such as to please the most exacting, but now that the first orders have been filled and expectations are on the *qui vive* for duplicates, a sudden falling off of trade makes matters entirely the opposite of what they should be. If this experience could only be taken as a lesson by those who have brought about this result it might be of inestimable benefit, but without a doubt the beginning of another season will find that not one particle of profit has been derived by the lesson which the practice referred to above has wrought.

Another correspondent of the same paper thinks that there is a tendency among New York manufacturers to get into staple lines of goods, such as gold jewellery, and more particular silver goods. The manufacture of plated jewellery is greatly overdone, and the constant change of patterns and cheapening of prices and quality has cut the business up so that there is little money in it. The public, that is the more intelligent portion having money to spend for jewellery, has learnt that much of the cheap plated jewellery is a snare and a delusion, and are clamouring for something better. The quality of the plate which the platers are selling averages better this year than formerly, and there is more inquiry for gold and silver jewellery. Fowler Brothers is one of the firms that are adding silver goods to their line. Their sterling silver bon-bon boxes sell to the finest trade, including the Gorham Manufacturing Co. and the Whiting Manufacturing Co. When such connoisseurs of silver as those buy goods from a rival manufacturer, they must be excellent indeed.

Many hundreds of engravers are out of work in the Eastern cities on account, according to an anti-"combine" organ, of the adoption by the manufacturers of Trust Watch Cases, of the machine-made, pressed, or rolled-on style of engraving. This style of work is very applicable for cheap goods, but any judge of engraving can see the difference at once; but everything goes with the Trust.

That well-known and always up to date journal, the New York *Jewelers' Weekly*, has lost the services of one of its two editors, Mr. Albert Ulmann, who has retired owing to failing health. Mr. Alonzo Rothschild, hitherto co-editor, now succeeds as sole editor and proprietor. We wish him a continuation of that success which the publication has so well merited since its installation.

The hide of the giant elephant Forepaugh, who had a record of killing ten men, and whom it was found necessary to strangle to death, by reason of his vicious habits, is now exposed in Tiffany's window, Union Square, New York. It has been tanned and cleaned in Philadelphia, and will be made up by this enterprising concern into pocket-books and valises. Curiosity hunters have, therefore, something to look forward to when these articles are manufactured.

Going Up.—Diamonds are going up in price, and the Toronto *Trader* thinks the prospects are that the advance is likely to be a permanent one. The reason simply is that the demand is far greater than the supply, and as long as this state of things continues prices are bound to stiffen. No human laboratory has ever been able to manufacture real diamonds such as are turned out of Nature's workshop, and as long as this remains so, these precious stones will continue to be an evidence of wealth. Jewellers with a good stock of diamonds on hand can therefore rest easy as to any chance of their depreciation in value.

The Philadelphia jewellery trade is not pausing long between summer inactivity and fall liveliness, and already, says the *Jewelers' Review*, the signs of big business are appearing in the distance. Not a few orders for fall trade have been placed, and the outlook is extremely encouraging. This is all the more a subject for congratulation when it is known that business for the past two months has been unusually dull and money has been very tight. One of the surest indications of the quickening pulse of trade is the increase in happenings in trade circles. It would seem as if the trade entire was disporting itself at country and seaside. Scores of our best known jewellers and attaches of the jobbing houses are enjoying their vacations or have just returned after a season of pleasure to resume the duties that another year will present to them. The judges in the local courts seem to have determined that jewellery thieves shall suffer the full extent of the law, and have sentenced an offender to five years for stealing a watch. The cut in silverware has created surprise and dissatisfaction in the trade. This commodity has felt the weight of the lowering so often, that silverware sells for next to nothing, and these indiscriminate slaughters of prices, seem without reason or business principle. Jobbers, retailers and consumers alike bewail the new order of things.

Applications for Letters Patent.

The following List of Patents has been compiled especially for *The Watchmaker, Jeweller and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; and 6, Lord Street, Liverpool.

11.788. D. Dennes, London, for "Improvements in obtaining precious metals from their ores and in means or apparatus employed therein." (Partly communicated by T. R. Rose, Denver). Dated July 24, 1889.

11,883. S. Trivick, London, for "Improvements in extracting precious metals from their ores, and in means or apparatus employed therein." Dated July 26, 1889.

11,998. W. C. Stubington, London, for "An improved and simplified apparatus for time checking and automatic registering machines, clocks, &c." Dated July 29, 1889.

12,009. D. McKellar, London, for "Enabling the wearer of spectacles to dispense with the aid of the lenses without detaching the spectacle frames from the face." Dated July 29, 1889.

12.017. D. Sherlock and J. Eshelby, Dublin, for "Improvements in the propulsion of clocks and kindred light machinery." Dated July 29, 1889.

12.072. W. Farquhar, Westminster, for "Improvements in and relating to rings for holding keys and similar articles." Dated July 30, 1889.

12.121. F. Hoffmann, London, for "Improvements in air motors for clocks and the like." Dated July 30, 1889.

12.189. I. Scheinberger, London, for "Improved means for winding a spring or weight for actuating clockwork or like mechanism." Dated July 31, 1889. (Complete Specification).

12,192. A. Cecil, London, for "An improved solitaire or shirt stud." Dated August 1, 1889.

12.221. A. G. G. Cumming, Glasgow, for "Improvements in or relating to the striking arrangement of clocks and watches." Dated August 1, 1889.

12,235. G. Green and E. A. Carpenter, London, for "Improvements in or applicable to bracelets, armlets and the like." Dated August 1, 1889.

12,315. G. Kamensky, London, for "An improved process of refining gold." Dated August 2, 1889.

12,330. H. W. Ley, London, for "Improvements in clocks." Dated August 2, 1889.

12,487. J. Skidmore and J. R. Windmill, Brierley Hill, for "A safe and secure fastening to buttons, brooches, ornaments and other attachments of male and female attire." Dated August 7, 1889.

12,540. D. Barry, London, for "An improved pin for scarfs or neckties." Dated August 8, 1889.

12,702. H. Albert, London, for "Improvements in watches." Dated August 12, 1889.

12,745. C. Ardré, London, for "An improved powder for cleaning, brightening and polishing diamonds, precious stones, gold, silver, plate, metals, glass, marble and analogous substances." Dated August 13, 1889.

12,771. P. A. Newton, a communication from The Ansonia Clock Co., United States, for "Improvements in pendulums of clocks." Dated August 13, 1889. (Complete Specification).

12.852. H. E. Newton, a communication from P. J. Edmunds, New South Wales, for "Improvements in spectacles." Date August 14, 1889. (Complete Specification).

12.989. A. M. Linney, Bedworth, for "An improvement in brooch pin fastenings." Dated August 17, 1889.

12,998. C. Wells, London, for "Improved electric apparatus for clocks." Dated August 17, 1889.

13.010. S. B. Hull, London, for "Improvements in watch protectors." Dated August 17, 1889.

Recent American Patents.

Apparatus for Testing Watch Balances and Hairsprings. John Logan	406,665
Box for Repeating Watches. H. Sandoz	407,040
Bracelet. W. B. Ballou	407,566
Calendar Clock. H. F. Wells	407,977
Cuff Holder. J. E. Emerson	406,435
Cuff Holder. W. E. Terry	407,705
Decorating Base Metals, Glass, &c., with Precious Metals. F. Roessler	407,305
Electric Clock for Use in Exposed Places. A. Speer	407,945
Electric Eyeglasses. H. Welcker	408,151
Eyeglasses. R. C. Kennedy	408,109
Fork Blank. F. Silliman, Jun.	406,480
Fork. D. J. Huckins	406,735
Fountain Pen. J. Friedmann	407,585
Fountain Pen. J. Friedmann	407,586
Fountain Pen. J. Morris	407,412
Fountain Pen. D. C. Demarest	407,999
Fountain Pen. D. C. Demarest	408,000
Glove fastener. E. J. Krastzer	407,295
Handle for Canes, Umbrellas, &c. A. Kessler	407,015
Hinged Button. R. W. A. Dittmann	407,643
Holder for Finger Rings. C. A. Kron	407,668
Kaleidoscope. J. W. Lovibond	407,937
Lens Blocking. J. J. Bausch	407,990
Method of Ornamenting Surfaces with Molten Metal. W. H. Marshall	406,923
Method of Decorating Metal Surfaces. N. C. Duncombe	406,999
Microscope. Stiles Frost	407,192
Non-Magnetic Alloy. H. Ostermann	408,130
Ornamental Chain. J. E. Crook	407,723
Ornamenting Gold Surfaces. L. Jagielky	407,953
Penholder. J. P. Egan	407,517
Postage Stamp Holder. D. M. Bloch	407,509
Powder Box. J. E. Roeder	407,449
Signal or Alarm Transmitter and Time Indicator. A. J. Reams	406,769
Self-Adjusting Eyeglass Frame. F. W. Nolte	407,789
Stem Winding and Setting Watch. C. Dinichert	407,642
Stem Winding and Setting Watch. G. F. Johnson	406,413
Stem Winding and Setting Watch. H. Rempe	407,243
Thread Cutter for Thimbles. O. Cady	407,719
Tool Holder. F. Müller	407,230
Watch Case. E. C. Chappatte	406,816
Watchmakers' Tweezers. J. A. Miller	408,037
Watch Movement. G. Hunter (Re-issue)	11,014
Watch Movement Holder. H. Heidendreich	407,481
Watch Winding Mechanism. W. N. Clifford	406,702

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller and Silversmith*, 7, St. Paul's Churchyard, E.C.

Gazette.

Partnerships Dissolved.

W. Tonks and Sons, Birmingham, brassfounders. C. Bradford and W. E. Ebblewhite, Birmingham, watch key manufacturers. Jane Band and J. Selby, Nottingham, opticians. Symons and Moses, Holborn Viaduct, City, and Kimberley and Johannisberg, South Africa. Grieshaber and Co., Neath, Glamorganshire, watchmakers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

To surrender in London.—Woods, A. W., St. George's Road, Pimlico, Rouge Dragon, at the College of Arms Public Examination, October 8, at 11. Jameson, Josiah, and Jameson, Mary (trading as Caleb Jameson and Co.). Houndsditch, City, wholesale cutlers. Jennings, William John, Tysoe Street, Clerkenwell, jeweller.

To surrender in the Country.—Wilson, F. John, Bristol, watchmaker. Rees, William Jones, Walton, near Liverpool, pawnbroker.

Adjudications.

W. J. Jennings, Tysoe Street, Clerkenwell, working jeweller. W. J. Rees, Walton, pawnbroker. R. P. Davies (trading as Davies and Son), Blaenau Festiniog, watchmaker. M. Franks, Blaenavon, pawnbroker. H. Lasalle, Bedfordbury, Covent Garden, theatrical jeweller.

Notices of Dividends.

In London.—E. J. Bone, Fulham Road, watchmaker, 10s., first. any Wednesday. Seear, Hasluck, and Co., 17, Holborn Viaduct. S. Thomas, Albemarle Street, Piccadilly, jeweller, 8d., second and final, Chief Official Receiver, 33, Carey Street. W. F. Warr, Barnwell Road, Brixton. jeweller, 1s., first and final, August 21, 29, New Bridge Street, E.C. Jane Bache, Wilmington Square, Clerkenwell, jeweller, 2½d., supplemental, any day, Chief Official Receiver, 33, Carey Street.

In the Country.—G. Moulton, Birmingham, thimble manufacturer, 11d., first and final, 25, Colmore Row, Birmingham. C. Welch and H. Harding (trading as C. Welch and Co.), Birmingham, die sinkers, 1s. 7d., first and final, Official Receiver, Birmingham. F. Rivalta, Wellington, Salop, jeweller, 3s. 9d., first and final. Official Receiver, Ludlow. W. G. Pilcher, Southsea, watchmaker, 3s. 8d.. first and final. Official Receiver, Portsea.

The Deeds of Arrangement Act, 1887.

Leicester.

Jobson, William, 20, The Haymarket (late of 54, Gallowtree Gate, Leicester), watchmaker and jeweller. Trustee, A. C. Palmer, Saint George's Chambers, Greyfriars, Leicester, C.A. Unsecured Liabilities, £1,165 11s. 10d. Estimated Net Assets, £985 12s. 10d. Deed of Composition dated July 22, 1889; filed July 27, 1889.

MIDDLESEX.

Vidler, Henry, 35, Warwick Street, South Belgravia, jeweller and diamond merchant. Trustee, M. Blanckensee, 3, Summer Hill Terrace, Birmingham, diamond merchant. Unsecured Liabilities, £1,851 7s. 6d. Estimated Net Assets, £1,164. Deed of Assignment with a view to pay creditors in full, by instalments, debtor covenanting to pay trustee £20 per month, commencing from August 31st, 1889, to be distributed by him from time to time amongst the said creditors. Deed of Composition dated July 31, 1889; filed August 3, 1889.

Kahn, Charles, 138 and 138*a*, Strand, W.C., retail jeweller and watchmaker. Trustee, Abraham Bromet, 38, Jewin Street, London, E.C., jeweller. Unsecured Liabilities, £720 8s. 4d. Estimated Net Assets, £667 4s. 6d. Creditors fully secured, £224 11s. 10d. Deed of Composition, 7s. 6d. in the £, by six equal instalments at three, six, nine, twelve, fifteen, and eighteen months from date of Deeds secured by Assignment to trustee. Deed of Composition dated July 26, 1889; filed July 30, 1889.

NORTHUMBERLAND.

Peel, William, and Co. (Robert Rochester, trading as), Stepney Road, Newcastle-on-Tyne, watch manufacturer. Trustee, J. M. Winter, Newcastle-on-Tyne, accountant. Unsecured Liabilities, £575 14s. 6d. Estimated Net Assets, £282 16s. 6d. Deed of Composition dated July 30, 1889; filed August 3, 1889.

SOMERSET.

Collings, Edward Francis, 31, Milsom Street, Bath, jeweller and dealer in fancy goods. Trustee, A. C. Palmer, 7 and 8, Railway Approach, London Bridge, S.E., P.A., with a Committee of Inspection. Unsecured Liabilities, £1,702 14s. 3d. Estimated Net Assets, £1,100. Deed of Composition dated August 21, 1889; filed August 23, 1889.

WORCESTER AND WARWICK.

Hirons, Charles Frederick, 18, Barr Street, Birmingham, and 166, Brighton Road, Moseley, silversmith and brass worker. Trustee, E. M. Sharp, 120, Colmore Row, Birmingham, C.A. Unsecured Liabilities, £779 12s. 9d. Estimated Net Assets, £418 13s. Creditors fully secured, £153 15s. Deed of Composition dated July 22, 1889; filed July 29, 1889.

BANKRUPTCY.

Re R. E. NORTH.—The case of R. E. North came again before the Bankruptcy Court on August 6. The debtor, a diamond merchant and polisher, of Hatton Garden, failed on June 21. The accounts now issued show liabilities £11,469, of which £11,339 is unsecured, and assets £1,931. The bankrupt states that in 1870 he commenced business as a diamond cutter and merchant with £500 capital. In August, 1887 he transferred the cutting business to a company, which, however, was not successfully floated, and in January, 1880, he sold the same business to another company (now in liquidation) for £25,000 in shares, and £5,000 in cash. Of this latter sum he received only £1,000. He attributes his failure to loss of credit through the unsuccessful attempt to float the first company, to loss (£2,000) through the failure of the second company, to loss (£6,711) on trading since January, 1888, and to other causes.

Re ROBERT PUGH DAVIES.—A meeting of the creditors of this debtor, who traded as R. Davies and Son, Dwyed House, Blaenau Festiniog, watchmaker and jeweller, was held at the offices of the Official Receiver, Chester, on August 8. The debtor having absconded he was adjudicated a bankrupt, and Mr. Poppleton, C.A. general manager of the Wholesale Traders' Association, Birmingham, was appointed trustee, with a committee of inspection. A large portion of the liabilities are due to creditors in Birmingham and Coventry.

Re GEORGE PATERSON.—In the Stonehaven Sheriff Court last month, George Paterson, watchmaker, Allardice Street, Stonehaven, was further examined before Sheriff Brown in his petition for *cessio*. Mr. H. L. Wilson, solicitor, Stonehaven, appeared for bankrupt and creditors. In answer to Mr. Haddon, solicitor, Aberdeen, bankrupt deponed that the only book he kept in connection with his business was a diary, in which he entered the names of parties who owed him money. The state of affairs, as far as his knowledge went, was correct. He had no household furniture, for it all belonged to his wife. Part of it was gifted to her by her father, and the rest was purchased by herself. Not keeping any books, he was unable to state the amount of his overturn in a year, but in Stonehaven during the last year he supposed it was about £250. His working expenses came to about 10s. 6d. per week, in addition to which for three weeks he paid a journeyman 18s. per week. His household expenses were about 28s. per week. He estimated his profit last year at from £75 to £80. The state of affairs showed a deficiency of £295 6s. 7d., and he accounted for that by bad health, bad trade, buying bankrupt stocks too dearly, and through bad debts at New Pitsligo. For five months he was partially disabled from lung disease at New Pitsligo, and he was not able to attend to business as it should have been. His bad debts amounted to about £75. By Mr. Wilson—Before sequestration was applied for he offered a composition of 8s. in the £. That offer was increased to 9s., but when he was trying to find caution *cessio* was applied for. The statutory oath was then administered. The state of affairs show the liabilities to be £411 16s. 7d.; the assets, deducting £108 15s. of preferential claims, £116 10s.—deficiency, £295 6s. 7d.

Re GEORGE BEST.—At the County Court, Cardiff, on August 21, George Best, a jeweller, formerly carrying on business in St. Mary Street, then Queen Street, and finally of the High Street Arcade, appeared for his final examination. The Official Receiver stated that the assets would only produce 1d. in the £. His Honour granted the debtor his discharge, but suspended its operation for eighteen months.

Re J. M. BARRON.—The first public examination of the debtor, who had carried on business in St. Mary's Butts, Reading, as a jeweller, took place last month in the Reading County Court. His statement of affairs showed creditors expected to rank to the amount of £338 16s. 2½d., including £337 12s. 1½d. to unsecured creditors. His assets were:—Stock, £54 2s. 9d.; book debts, £1 10s. 8d.; bill of exchange, 18s.; total, £56 11s. 5d. From this amount £20 7s. had to be deducted for preferential creditors, and thus the debtor's deficiency was £302 11s. 9½d. The Official Receiver's (Mr. Cecil Mercer's) observations of the case were: The receiving order was made on the 2nd day of July, 1889, on the debtor's own petition. The debtor states that he commenced business in November, 1886, at Walworth Road, S.E., without capital; but when he commenced business at Reading he had a capital of £50, which he borrowed. The debtor has produced a "jobbing book" and "selling book." They have, however, only been indifferently kept, and do not show his business transactions and financial position for the period he has been in business. He appears to have kept no record of his receipts and payments. The debtor states that a private meeting of his creditors was held on June 28, 1889, at the office of Mr. Child, 24, Poultry, E.C., for which a statement of his affairs was prepared, showing liabilities £238, and assets £109 5s. 6d. An offer of 2s. 6d. in the £ was made, payable in three months, which was not accepted. He attributes his present position to bad trade, and states that he became aware of his insolvency about September last; he has contracted certain debts since that date. The only expectation of being able to pay them was an "improvement in trade." He accounts for his deficiency as follows:—Excess of liabilities over assets, May, 1888, £40; net loss arising from carrying on business from May, 1888, to date of Receiving Order, £34 19s. 1d.; loss by bad debts, £11 0s. 6d.; expenses of himself and wife, from May, 1888, to date of Receiving Order, £150; depreciation in stock as per statement, £54 2s. 9d.; deficiency unaccounted for, £12 3s. 4½d.; total £302 11s. 9½d. In reply to the Official Receiver, he said he commenced business in November, 1886, in Walworth, and then in Reading. He borrowed £50 from his father-in-law, Mr. Flowers, before he came to Reading and £50 when he came to Reading. He had no capital besides. He showed a deficiency amounting to £302 His takings averaged £5 a week and his living expenses £3 a week. His rent was £55. He expected trade to improve, but a number of new shops were opened. He had offered 2s. 6d. in the £, but his creditors would not accept it. In reply to Mr. Myers, who appeared for him, the debtor said his father-in-law had proved for £100 since. His stock had realised £85. That was more than he valued it at. The examination was adjourned to the October Court.

CORRESPONDENCE

All Letters for Publication to be addressed to the EDITOR *of* THE WATCHMAKER, JEWELLER AND SILVERSMITH, *7, St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

TO THE EDITOR OF *The Watchmaker, Jeweller and Silversmith.*

18, Bentinck Street, W.,
August 12, 1889.

SIR,—I had much pleasure in reading the notice you gave my book, "The Philosophy of Sight:" please accept my sincere thanks. I would, however, point to a glaring error in the transposition, "But though that man with a glass eye has two eyes," should be "with an eye glass." I would be pleased if you would allow this correction to appear in your next number.

If Mr. W. D. Mason, whose very instructive and interesting article on Defective Sight and its Optical Correction you give, will refer to my book, he will find therein explained how erect vision takes place with an inverted image.

I am, SIR,
Yours obediently,
A. FOURNET.

DEAR SIR,—You have reviewed my little book very nicely. Thanks. I am in frequent communication with a very eminent ophthalmic surgeon, and he says that the electric light does *not* affect the eyes in the manner stated in your magazine. Also that the "shirt collar" disease is old.

It is best, of course, that all your statements should be strictly correct.

Yours sincerely,
HENRY STEER, F.R.HIST.S., M.B.H.I.
Market Place and 1, Iron Gate, Derby.
August 14, 1889.

The Watchmaker, Jeweller & Silversmith.

Edited by D. GLASGOW, Jun.

Entered at Stationers' Hall.] [*Registered for Transmission Abroad.*

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. The Watchmaker, Jeweller and Silversmith will be found an exceptional medium for advertising. Special Notices, Situations, &c., per insertion, 1s. for two lines, prepaid.

Address all business communications to the Publishers,

Messrs. TRUSLOVE & SHIRLEY,
The Watchmaker, Jeweller & Silversmith,
7, ST. PAUL'S CHURCHYARD, LONDON.

Agents for New South Wales and Queensland:—
Messrs. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

The tittle-tattle throughout the society papers during the past month has been thoroughly in the same strain ; most of the pars furnished for the delectation of those who are supposed to have some collateral relationship with, or interest in *le beau monde*, partaking of the excitement due, doubtless, to the big gooseberry season.

Parliament is out of town ; London is empty ; the Strand is up ; nobody is to be seen in the parks, which are given up to the steam-rollers ; this, with the British Association's Meeting at Newcastle-upon-Tyne, dished up in various forms, might well form a summary illustrative of the straits for news to which our newspaper caterers are reduced at this period of the year. But "'twas ever thus," and, until Parliament take to sitting all the year round (which the state of legislative business makes imminent in the near future), presumably ever will be.

As for the items of more immediate interest to our readers, these too, in their paucity, have synchronised with those of more public concern, and we are constrained to look into a good many pigeon-holes before we can find a subject sufficiently dignified to work up into a half column or so for the front page of the *Watchmaker, Jeweller and Silversmith.* However, the month is drawing to a close ; compositors are waiting, and . . . What do our readers think of the prospects for the "fall" trade (Autumn commenced, it is perhaps unnecessary to remind those who are engaged in the business of measuring time, at about 9 o'clock, p.m., on Sunday, September 22) now that all workers are gotten back to their varied avocations ? Will the season be a good one ? Answering these questions from what we have observed, we say unhesitatingly that no better prospects have been in store for the fancy trade for a considerable number of years, and, judging from the manner in which manufacturers are exerting themselves, we are undoubtedly in accord with the main body of our constituents.

In the great manufacturing centres of Sheffield and Birmingham an immense amount of activity is observable, and there is every indication that the London trades will not be far behind. It is some consolation, after the grumblings that have been heard in more than one quarter, to know that a large part of this activity is the result of orders actually in hand, and the more so from the fact that, consequently, little fear need be entertained of the market becoming glutted.

Our favourable predictions with regard to the state of trade of last month have indeed been verified in a most remarkable and gratifying manner; and we trust it will be a long time before, if ever, it becomes our painful office to chronicle any more events like some of the sad trade happenings of the past decade.

We publish on another page a series of questions in an article from a perplexed correspondent of a contemporary anent the various virtues alleged to be possessed by the different non-magnetic watches and protective appliances which are worth a word *en passant.* The fact of the correspondent in question—assumably a non-technical or, at all events, a non-horological person—being perplexed in the face of the numerous claims set forth for these watches and appliances by their rival manufacturers is not surprising, what is so is that the said manufacturers cannot rest content with asserting that all their geese are swans, without vilifying the goods of other makers. The fact is, anyone, that is to say, any watchmaker, can construct a watch that shall be unaffected by magnetism permanently; the merits of such watches are only of degree, in which other factors come in for consideration. As for the anti-magnetic shield, that should also be an efficient protection for an ordinary watch, provided that the iron is soft; but it has not yet become an article of commerce in this country.

The article by "Manufacturer" on Long Terms and Accommodation Bills, published on another page, should prove interesting to many of those who have groaned or are groaning under some of the evils therein alluded to. We have not much confidence, however, in the present state of trade competition, that the remedies our correspondent suggests will be speedily adopted. The large number of "small men," who are under the thumbs of the capitalists who finance them, has created a regular sweating system in the jewellery trade, in abetting which a certain number of manufacturers and factors are equally culpable: to expect that this system will be done away with in any measurable distance of time—that those who have found their account in introducing it will readily forego their dominant advantages—would be to look for a veritable millennium in the jewellery trade, much to be wished for, doubtless, but infinitesimally small on the far-off horizon.

It is not generally known that John L. Sullivan, the pugilist, was at one time in the jewellery trade. A New York trader says that the notorious prize fighter served over two years of his youth in a Boston, Mass., retail store. And now he is going to serve one year in jail, which is a worse place than a jewellery store.

GENERAL NOTES

We call the attention of manufacturers and exporters to the announcement on page 101 *of this issue.*

The American Waltham Watch Company is about to open a Canadian branch office.

According to the Inland Revenue Report for the twelve months ending March 31 last, there are 4821 pawnbrokers in the United Kingdom.

The death took place last month, at Eastbourne, of Dr. Royston Piggott, the distinguished astronomer and Fellow of the Royal Society. Deceased was a voluminous author on scientific subjects.

Suicide of a Nottingham Jeweller.—Edwin Hough, jeweller and electro-plater, of 12, Mount Street, Nottingham, committed suicide on the 9th ult., by drinking a quantity of cyanide of potassium. Melancholia, owing to depression in business, was the alleged cause of the act.

Robbery from a Victoria Jeweller's.—Advices to hand give the details of a daring robbery from the branch shop, 63, Johnston Street, Collingwood, of Mr. G. H. Armfield. During the absence of the managers to dinner, the show cases were completely looted, property estimated to be worth £300 being removed, in full view of passers by.

Curious Relic.—Mr Luke Hancock, watchmaker and jeweller, 63, City Road, is exhibiting in his window an old bill which was made out in March, 1780, by his predecessor in the business, Mr. George Mackie, to "The Rev. Mr. Charles Wesley," the two or three items being for the mending of a watch for that distinguished divine.

The Melbourne Exhibition Awards.—Sir Graham Berry, Agent-General for Victoria, received last month a telegraphic dispatch from the Government of the Colony stating that the awards to exhibitors at the Melbourne Centennial Exhibition were finally settled and would be gazetted shortly. The medals are now being struck off at the Melbourne Mint, and will be distributed to the successful exhibitors as soon as available.

Mr. Albert Rothschild, editor and publisher of our contemporary *The New York Jewelers' Weekly*, was arrested recently at the instance of J. Wiesbauer, President of the Wiesbauer Manufacturing Co., of Buffalo, for having published in his paper a paragraph which was held to reflect on the credit of the company. The company demands 10,000 dols. damages. Mr. Rothschild furnished bonds very promptly, and was released by the sheriff.

Novelties in Jewellery.—The latest novelty in bracelets is a motto from the wearer's favourite author engraved in black letters if the bracelet be silver, in silver on jet bracelets. Elephant's hair encircled with seed pearls is a less tasteful novelty for bracelets and brooches. A pretty brooch to be seen in New Bond Street is a crescent-shaped moonstone brooch, set in diamonds, the face of the man in the moon being engraved on the moonstone.

Robbery from Mr. Kullberg's Case at the Paris Exhibition.—During the change of guards at the Exhibition, Mr. Kullberg's case was burgled last month, watches and chronometers valued at £200 being stolen. The robbery was evidently part of a well-planned scheme, the operations having been accurately timed and successfully carried out under what must have been most ticklish conditions. No trace of the thieves has yet been found.

The Utility of a Time-Ball.—An Albany (Western Australia) paper thinks that although the railway time is that of the capital, Perth, there is still a good reason for hoisting the time-ball at local noon, seeing that they are ten minutes ahead of Perth time, so that anyone setting his watch by the ball would run no risk of losing his train or missing appointments. Were they ten minutes West of Perth endless trouble and annoyance would be caused. What price the Universal Hour after this?

South African Diamonds.—The production of diamonds in British South Africa was very large in 1887, amounting to 3,646,899¾ carats. The average value of the diamonds raised having been 22s. 1¼d. per carat, the gross value of the production of 1887 was £4,033,583. The production was made up as follows—Kimberley mine, 1,333,832½ carats, valued at £1,410,208; De Beer's mine, 1,014,048 carats, valued at £1,022,878; Dutoitspan mine, 696,576¼ carats, valued at £987,284; Bultfontein mine, 602,246 carats, valued at £612,963; and St. Augustine mine, 197 carats, valued at £250.

The Proposed Belgian Exhibition in London.—Several of the large Brussels firms have decided to participate in the Belgian National Exhibition which it is proposed to hold in London next year, and there will be a very large show of lace and other manufactures for which Belgium is famous. Those who were in Brussels in 1880 had an opportunity of realising at the Exhibition there the progress made by this industrious little country since the first year of its independence (1830), and those who did not see this Exhibition will be surprised, says a contemporary, at the evidence of its extraordinary industry which will be shown next year.

Fraudulent Baileeship.—At Bury last month, William Williams, watchmaker, pleaded guilty to a charge of stealing a watch as bailee, the excuse being that there was no felonious intention on the part of the accused in keeping prosecutor out of his watch, but that it was the outcome of a drunken spree. The interest in this case as far as we are concerned attaches mainly to the statement made in court, that the watch was made to time a race to the twelfth part of a second, and that "prisoner was the patentee of the movement, and he had improved it so as to time a race to the sixteenth part of a second." We should like to see that watch.

Tiers État.—An amusing story is told by a contemporary. Some time ago, it will be remembered, the wife of the Austrian Ambassador lost her jewels, and Mrs. Henry White, of the American Embassy, very soon after suffered the same fate. The Austrian lady, accustomed either to the more rigid espionage or the more able police system of her own country, asked Lord Salisbury how it was that these things were allowed to go on, and urged, with feminine velocity, that some severe steps should be promptly taken by which the thieves would be brought to justice and her precious jewels be restored. "Ah!" replied Lord Salisbury, with a look of affected sympathy, "we must be very careful in England. Remember, all these people have votes."

Bracelet Watches.—The new compass-watch bracelet is, the *Nottingham Daily Express* thinks, a valuable addition to the jewellery of men who wear bangles. It is an extension to the male sex of the recent fashion among women of wearing watches on the wrist, but it is to be feared that the enterprise of the inventor will not be rewarded now that the first flush of the novelty has passed. No man who wears bangles will confess to it, and certainly the fashion isn't likely to spread, even on the excuse of utility. The bracelet is certainly useful to men out riding or bicycling, because the time is ascertainable (and, as the watch is fitted with a compass, the bearings also) by merely pulling up the cuff and glancing at the wrist.

American's Love of Diamonds.—The fondness of the Americans for diamonds is notorious, and it is often carried into an extravagance closely associated with vulgarity and bad taste. But the latest caprice in the wearing of gems is altogether astounding. An evening paper is responsible for the statement that ladies at the seaside now adorn their bathing costumes with the costly baubles, and take care that they are not carried off by the waves, by keeping clear of the breakers. In order to exhibit jewels they thus deny themselves the luxury of the health-giving dip. This craze was initiated by one young woman who thought her diamonds might be stolen if left in her bathing-house. Others of the fair sex, who are nothing if not imitative, determined not to be outshone in the display of glittering adornments. The fashion would soon become too ludicrous to last if male bathers wore their huge shirt-studs and rings and their enormous watch-chains.

Disappearance of a Jeweller's Traveller.—Benjamin Tucks, traveller for Mr. Charles Miller, watchmaker and jeweller, High Street, Galashiels, has been missing since August 19. Tucks left Galashiels on August 12 with jewellery to the value of about £100 for Leadhills, Lanarkshire, and as he failed to communicate with his employer before the former date, or to forward a remittance of his receipts, he being empowered to collect accounts, Mr. Miller got uneasy, and left on that date for Leadhills, where he learned that Tucks had just taken train for Peebles. Thither Mr. Miller went, but only to find that Tucks had again disappeared. The matter is now in the hands of the police, who have issued handbills throughout the country giving a description of the missing man, and ordering his apprehension if found, but as yet no trace of his whereabouts has been discovered.

A Peculiar Wedding Ring.—A New York paper reports this description of a new wedding ring which looks just like any other ring, the only difference being that it has a crooked scratch across the surface. But when a tiny pair of jeweller's pincers are thrust into the inner edge of the ring, opposite what appears to be the scratch, and the needle pressed lightly, instantly the ring drops into one's hand transformed into tiny hoops of gold looped together. The needle splits the ring into halves, each half having a flat, broad edge. These flat surfaces are designed for the purpose of being engraved with any tender or romantic inscription that the bride or groom desires to have placed upon the ring, and they will contain much more than can be put upon the inner surface of an ordinary ring. After the engraving is done, the ring is closed again by fitting the two hoops together and locking them securely by a concealed latch fitted on the inner edge of the hoop. It requires the closest scrutiny to discover that the ring is not an ordinary hoop of gold. These rings have made a big hit. One of them was used at a swell society marriage in a Fifth Avenue church the other day. The society belle who was the bride made the selection herself.

Important Discovery of Uranium.—The centenary of the discovery of uranium by Klaproth has just been marked by the finding of a continuous lode at the Union Mine, Grampound Road, Cornwall, which is believed to be the only known lode in the world. This discovery is regarded as unique in the history of the metal, for the lode is what is known as a true fissure vein, and the ore is found to contain an average of twelve per cent. of the pure metal, the assays going up as high as 30 per cent. in some parts of the lode. Several tons of the ore have already been raised and sold, fetching high prices. The lode traverses the mine from north to south, and the uranium occurs in it chiefly as a sesqui-oxide. It is anticipated that the present discovery will enable two important applications of the metal to be followed up. The first is as a substitute for gold in electro-plated ware, inasmuch as with platinum and copper it forms two beautiful alloys, each having the appearance of gold, and the former also resisting the action of acids. The second application is in connection with electric installations, where its usefulness consists in its high electrical resistance. The rarity of this metal is indicated by its market price, which is about £2,400 per ton. There are several oxides of it; but the best known and most important is the sesqui-oxide, which forms a number of beautiful yellow salts. This oxide is largely employed for imparting delicate golden and greenish yellow tints to glass, while the protoxide is much used in producing the costly black porcelain. It is found in Cornwall, Saxony, and Bohemia, but hitherto has only been met with in isolated pockets and patches.

The Diamond Market and Metals.

The Diamond Market.—Advices from *Amsterdam* state that the little demand continues, and, that were prices somewhat lower, considerable business would result. *Rough* and *cleavages* are especially in request.

A good many foreign buyers from *Amsterdam*, and, notably, *Antwerp*, were in *London* during the month, but, prices being maintained, and a limited supply of stones being forthcoming, no big deals are recorded.

The following in a contemporary, from Mr. Max Freund, of that name and Co., New York, is interesting, as giving a varied view of the subject:—

"I sailed from New York for Amsterdam on June 5th last, and on reaching my destination, was very quickly made aware that the diamond market there was not in its normal condition. Goods that were suitable for the American market were very scarce, and such stones as were really procurable were quoted at 'Eiffel Tower' prices, to use one of your own phrases. Indeed it struck me as most singular, that, as the diamonds became dearer, they also grew more scarce, and first-class stones were almost impossible to obtain at all. As to the cause of this marked change, I found that opinions differed on every hand. Some attributed it to the presence of an unusual number of buyers from almost every section of the habitable globe, which tempted a restriction of the output, while others felt positive that a natural diminution was taking place in the supply from the mines. There certainly were as many buyers in the market as ever I have seen in Europe before, if not more so; but I, for my part, am strongly of opinion that the syndicate controlling all the diamond mines at the Cape, is solely responsible for this high pressure which is being felt all over the world. It has restricted the output considerably, and is now starting in to pull the strings with a vengeance. Nor is this all. A few days before my departure for America, which was toward the latter end of August, 'rough' had advanced another three points, which is equivalent to ten per cent., and I got it on the best authority that it would go up still higher, and that in a very short time. Why, when I returned to Amsterdam from Paris and Germany, I had to pay much higher prices for goods than I had purchased four weeks previous. But I repeat, you cannot get the stones even in spite of the rise, and that's where the rub comes in. Of course, yellow goods are far more plentiful than the fine, white, round stones, but they are just as high in proportion. It goes almost without saying that the public, so long as they want diamonds, will have to stand the increase the same as the dealer."

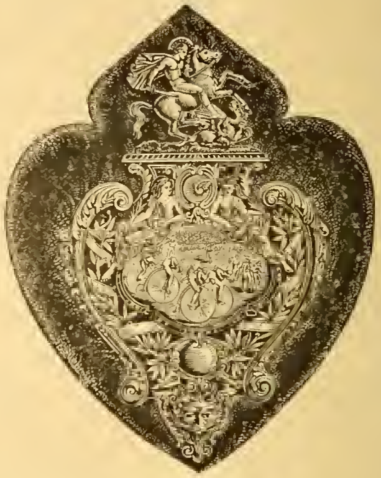
Metals.—*Silver.*—The market has been firm throughout the month, latest quotations for Bars being $42\frac{9}{16}$d. per oz. *Copper.*—Prices, fluctuating slightly during the month, are at the date of this report firm at £42 17s. 6d., for three months prompt, and £42 per ton, cash. The imports and deliveries both show a considerable increase over those of the same period of last year, and the difference in the quotations is sufficient evidence, if any further such were wanting, of the complete manner in which the various syndicates have subsided.

Messrs. E. Hopkinson and D. Appleton, of Manchester, have taken out a patent (No. 8966) for improvements connected with or applicable to baths or vessels containing liquids used in electro-plating, &c. By means of a circulating pump the surface liquid is drawn off and forced out through the perforations of a delivery pipe arranged near the bottom of the tank, thus maintaining a uniform density.

TRADE NOTES

Messrs. Borgzinner, Bros., of 8, Jewin Crescent, E.C., send us their illustrated catalogue of jewellery cases, window fittings, and other specialities. This price list is well thought out and clearly arranged, and should be in the hands of every jeweller doing a sale trade.

Messrs. P. Vaughton and Sons, of Gothic Works, Birmingham, send us a description of their new registered challenge shield, of which the annexed cut is an illustration. The modelling, carving, and chasing have all been done by the best artists in these branches in the trade, and the whole has taken twelve months to finish. The size of the shield is 24in. by 18in., and will be produced in bronze, parcel gilt ditto, oxidized ditto, gilt ditto, and solid silver. The group surmounting the shield is a very finely modelled St. George and the Dragon, and this group, and the centre piece (representing a bicycle race) with the two figures, "Health and Strength," surmounting it, are carried out in very high relief, almost in the "round" in fact. A spray of laurel, with an intertwining scroll, is carried up each side of the shield. The scroll and the small shield at the bottom are intended for the name of winner or other inscription to be engraved upon them. The point at the bottom of the shield is filled with a head of Hercules, and at the top there is a small winged wheel. The St. George and the Dragon, the bicycle centre, and the winged wheel are all moveable, and can have other subjects substituted for them. For instance, if the shield is for a regatta prize, the model of a yacht on the top and a rowing subject are put on the centre, and a life buoy in the place of the winged wheel; if for football, a football subject as centre, and a ball in place of wheel.



We understand that the business carried on by the late Mr. James Smith, in Market Street, Aberdeen, for a period of nearly 50 years—first as a partner of the firm of Gill and Smith, and latterly in his own name—is to be carried on by his son, Mr. W. A. Smith, under the name of James Smith and Son. The late Mr. Smith, who died on the 25th of June last, was well known over the greater part of Scotland, where he used to travel regularly. He was ever held in esteem by those who were acquainted with him, and by those with whom he had business connections. We are glad therefore to learn that his son, who has been associated with him for many years past means to continue the business.

Gold Pens.—Messrs. Mabie, Todd, and Bard, of New York, and 93, Cheapside, E.C., send us their catalogue of gold pens. A representative of the firm stated in conversation the other day, that English gold pen makers do not construct these useful office adjuncts scientifically; that they are neither suited for use nor wear, each pen being completed by one man, instead of the divers processes being divided. Unwilling though we are to believe this, we are constrained to admit the claims to excellence of Messrs. Mabie, Todd, and Co's products, both from the experience of ourselves and others. The numerous testimonials, many evidently spontaneous, set forth in the illustrated catalogue are also a guarantee that the goods manufactured by the firm are what they are represented. Jewellers who stock these goods would do well to ascertain the terms on which they are offered to the trade; being well advertised, they should be a good line to both wholesalers and retailers.

The First Dynamo Electro-Plating Machine.—Messrs. Thomas Prince and Son, Ryland Street, Birmingham, have now on view at the Birmingham Exhibition, the first electro-plating dynamo machine. This dynamo, which was invented by the late J. S. Woolrich, of Birmingham, founded upon Faraday's discovery of induction, was constructed by Messrs. Prince, in 1844, and worked by them for many years, until superseded by others of improved construction and greater power. It is the first magnetic that ever deposited gold, silver, or copper, and is the forerunner of all the magnificent dynamo machines that have since been invented. Professor Faraday, on the occasion of the meeting of the British Association, paid a visit to Prince's works, with some of his scientific friends, to see this application of his great discovery in operation, and expressed his delight at seeing his discovery so early and extensively applied, and carried into practical use. To Birmingham belongs the honour, not only of introducing electro-plate, the use of which has extended to every civilised nation, but also the honour of first adopting Faraday's discovery of obtaining electricity from magnetism, which has influenced science and art so greatly. Alongside this large machine, Messrs. Prince and Son show their "Little Wonder," a dynamo of the latest pattern, which with one-tenth of the driving power, deposits ten times as much metal.

BIRMINGHAM
NEWS

From Our Correspondent.

The revival of trade in the staple trades, which has been increasing and becoming firmer for several months past, appears to have extended to the fancy and jewellery branches, consequently reports in these branches are better, most firms being fully occupied and pushed for delivery of goods on order. The prospects of a brisk winter trade are very encouraging, and a more sanguine tone prevails generally than has been the case for some years past; notwithstanding all this, travellers continue to push for orders and competition remains as keen as ever, so that buyers are able to place orders at low prices, and no doubt our retail friends will be able to reap a little benefit—if trade still continues to improve—both as regards prices and the number of sales.

* * *

The enterprising "Jeweller's Traveller" evidently intends going with the times, and as that seems to be going upon either two or three wheels, he appears to have selected the two as his mode of progression as being the fleetest (I presume) and now travels the salubrious neighbourhood of Vyse Street and its branches upon a safety bicycle, with a roll of the latest patterns under his arm, and the stock following upon the less speedy and more roomy hand-cart. I would strongly recommend one of the cycle manufacturers to open a depôt in the vicinity as a speculation, as there will no doubt be a rush upon the iron steed, and we may soon expect to see regiments of the two-wheeler outside every factor's warehouse, when the buyer is at home. Could we not carry this a trifle farther and persuade our travellers to have the sign fixed in front of the machine, instead of that stupid old-fashioned way of having it over the door of one's premises?

* * *

The Jewellers' and Silversmiths' Association continues to make itself known and felt; our Birmingham readers have already seen the large posters announcing the Art Classes for jewellers in connection with the School of Art, and under the auspices of the Association; but in addition to these all the members of the Association received a circular calling their attention to the fact that the classes were again open with the additional privilege that female students would be admitted; the fees to be paid half by the funds of the Association, the other half by the introducer (a member), a form of admission being attached. The student consequently is admitted free. What could you wish for more?

* * *

The dreaded element of fire does not often get the upper hand in a jeweller's premises, but when it does it appears to find something very combustible, and goes ahead merrily. In the recent fire at Messrs. Levetus, Bros., jewellers, Vittoria Street, Birmingham, when about £500 worth of working tools and machinery, &c., were destroyed, the heat was so great as to melt up a quantity of rough gold work that was left out of the safe, in spite of the fact that it was enclosed in one of the workmen's boxes; none of the other stock was injured, as the fire was confined to the workshops; the origin of the fire is unknown. The loss was covered by insurance, and the re-fitting of premises has already commenced.

* * *

The number of jewellers who prefer to purchase their gold and silver ready alloyed and melted in the form of rolled sheets and wire of various sizes and qualities, are evidently on the increase, as bullion dealers and refiners report a considerable increase in this branch of their business of late, one of them stating that his turn-over in this particular line for September last was considerably more than any month since he commenced business, which is about 25 years ago. This is scarcely to be wondered at, as the refiners offer such facilities to small manufacturers in the melting and supplying of rolled alloys that it hardly pays to melt small quantities, and the convenience is evidently appreciated; besides this, a guarantee is given that the metal is of the standard quoted, and will pass the Assay Office test, and an allowance is made on the purchase if the work should get "cut up at the Hall," as occasionally happens.

SHEFFIELD
NOTES

From Our Correspondent.

The Master Cutler is dead—officially. Long live the Master Cutler! The ancient corporation of Cutlers of Hallamshire has, with quaint ceremonial, installed a new master. In the busy streets, people pause to contemplate the little procession as it wends its way from the Cutlers' hall to the town hall. First comes the beadle in his cocked hat, then the retiring master cutler with the master cutler elect, together with an array of past-masters, searchers, and so forth. A little variety is lent to the display by the presence of the law clerk and the chaplain, each in the robes of his office; otherwise the procession would scarcely be noticed as it moves slowly down the pavement of the High Street, jostled by citizens intent on their usual avocations.

Down at the town hall the principal court room is surrendered for the time being to the Cutlers' Company. The master cutler takes the place of the stipendiary, and the installation ceremony is proceeded with in due form. Returning to the Cutlers' hall, the company partake of the traditionary "browis," a dish the ingredients of which are only known to the initiated. They then cross the square to the church, where the annual sermon is preached by the chaplain. In the evening the façade of the Cutlers' hall is brilliantly illuminated, and the new master cutler entertains his guests, consisting of ministers of state, big wigs of the army and navy, M.P.'s, and distinguished people in general. Such is the Cutlers' feast—an institution inaugurated humbly enough generations ago by a few small cutlers meeting to partake of "browis," but which has developed into a great national banquet.

ONE of the Sheffield newspapers affects great surprise that the minister who represented Her Majesty's Government at the Cutlers' feast made no allusion to what it calls the burning question of the abolition of the Plate Duties and compulsory Hall-marking. Asking why this was so, it proceeds to answer the question in its own way, namely, that the views of ministers on the subject are diametrically opposed to those of manufacturers. Of course, it does not follow, as this advocate of very free trade assumes, that the ministers are right and the manufacturers wrong. In any case the latter are naturally of opinion that they know their own business best. A great deal is made of the so-called injustice to the Indian manufacturer in not being allowed to introduce his goods into the home market. But there is really nothing to prevent his doing so, providing he brings his silver up to the home standard. And this constitutes the root and kernel of the whole matter. Is it desirable in the interest of honest trading to abolish the compulsory Hall-mark? Manufacturers are of opinion that it is not, and they are practically unanimous on the point. If it pleases Government to abolish the duty they won't object, although they are not sanguine as to any beneficial result accruing.

DONCASTER races are over, and people all round begin to pull themselves together. It is generally understood that gas may be lit in the workshops after the races. Orders are expected to come in, and the slackness which generally obtains in July and August gives place to renewed activity. Of course, Doncaster races have nothing to do with all this, although a good many people seem to think they have. Sheffield certainly contributes its full quota to the Carnival in the neighbouring town, but any little excitement attendant upon this may safely be said to have very little effect upon business. The fact is, this is the turning point in the season. People have, to a large extent, finished their holidays, and are prepared to buckle-to in earnest. It is rather soon to judge as to how the silver trade is going to fare in the coming season, but judging from the state of the iron, steel, and coal trades, the probability is that manufacturers have a good time in front of them.

THIS is the season when we Sheffielders are most alive to the fact that ours is not a beautiful town. It's all very well to talk about "home, sweet home," but our hearts are sad nevertheless, as the train brings us into that region of blasted trees and sickly vegetation which adjoins the town on the east. We have left behind us some clean town on the eastern coast, where the flowers are blooming with what appears to us preternatural brilliancy, and the trees are still fresh and green in spite of the advancing season. And we find ourselves once more in streets where the rolling clouds of black smoke nearly choke us. But we shall soon get used to it. Long ere Christmas we shall find ourselves taking an interest in street improvements, the new municipal buildings, the extension of the electric light, and other questions, as though Sheffield was a tolerable place to live in. It is a merciful dispensation of Providence, that human nature is so constituted, that it can adapt itself to almost any surroundings.

VAGUE rumours have from time to time obtained currency to the effect that large stores of ivory are locked up somewhere in the interior of Africa, and that they only require a safe conduct to the coast in order to become available for commercial purposes. Stanley, it is said, has a large supply in his possession, which adds an additional interest to the fortunes of the daring explorer. The wish, no doubt, is father to the thought, for the growing scarcity of ivory is becoming a very serious matter to silversmiths and makers of the best cutlery. The dearth has stimulated imitations of the real article, some of them so successful, that only an expert can tell the difference. Nevertheless, people will have ivory, whatever the cost may be. That used by silversmiths seems more elaborately carved than it used to be. The more the raw material costs, the more people appear willing to pay for its manipulation.

THE rapidly shortening days are naturally suggestive of lamps. People with valuable furniture and pictures don't like gas, and the electric light as yet is not very common in private houses. The next best thing is the paraffin lamp, an article which lends itself to a great variety of highly artistic treatment. I came across some very fine specimens the other day in the show-rooms of Messrs. John Round and Son, who seem, in one department of their business, to make a specialty of lamps. One very important feature was pointed out to me in the shape of a self-acting extinguisher, which comes into operation in the event of the lamp being accidentally overturned. This removes the chief objection to the use of paraffin, namely, its liability to accident.

THE agitation against the smoke nuisance is bearing fruit. A batch of some half dozen cases came before the magistrates the other day, and an order to abate the nuisance in a given time was made in each of them. The prosecutions were undertaken at the instance of the Town Clerk, who intimated that each offender would be dealt with in turn—a significant hint which effectually answered the old plea, that the persons proceeded against were no worse than their neighbours. So far only the owners of engine chimneys have been prosecuted. The tug-of-war, however, will take place when the rolling mills and steel works come to be dealt with. If anything can be done with them, we may hope ultimately to breathe a pure atmosphere without going twenty miles out of the town to find it.

THE example of the Goldsmiths' Company, at the corner of York and High Streets, has been followed by Mr. H. L. Brown, watchmaker and jeweller, of Market Place, who has fitted up the whole of his premises with the electric light. Mr. Brown has had for some time an arc lamp outside his shop, but the advantages of incandescent lamps for inside, and especially window lighting, have been made so obvious by the Goldsmiths' Company, that Mr. Brown has been constrained to follow suit. The manner in which these lamps can be insinuated, without damage to the stock, among the goods displayed in the windows, has not only a very pretty general effect, but sets out the stock to the very best advantage. It would be utterly impossible to light up a window in this way with gas, without irretrievably ruining the whole of the goods.

Midland Jottings.

By W. K. P.

WHATEVER the ultimate state of the ivory market may be, the rapid rise in price of this material affects considerably several of the Industries of Birmingham as well as the cutlery trade of Sheffield. At present no really presentable substitute for ivory has been found, though attempts such as zylonite, celluloid, wood, bone, &c., have all been tried and found wanting. There is now an opening for some really good designs in metal hafts to knives—table, carvers, dessert and fish—and there is no reason at all why manufacturers should not avail themselves of this opportunity and produce some taking things in metal handles to replace the ivory which is becoming somewhat difficult to obtain. It will probably be a long time before the supply of ivory really fails, but it is already inadequate to the demand. There are many people, doubtless, who will always have ivory, at whatever cost; and there is no gainsaying its cleanliness and good appearance; but there should be no difficulty in introducing other kinds of handles which should have a good run and eventually supersede the ivory handles for general use.

Mr. Frank B. Wilson, of Hall Street, reports that trade in pearl and ivory handles for fish carvers, salad servers, &c., is just at the present time in rather a dull state. The perturbations of the ivory market have a great deal to do with this. Fortunately Mr. Wilson had a large stock of ivory before the prices went up, which he has been able to manipulate in a profitable manner. Mr. Wilson always buys his rough material at the best advantage, obtaining it from the best market, and paying cash for it. He has special facilities for cutting fine pearl handles, and I saw some very well-finished specimens in his warehouse. Mr. Wilson only supplies the trade with his handles. I also saw, while at his place, some very good finished salad servers and fish carvers of excellent design and workmanship, and these Mr. Wilson produces in addition to the handles alone.

Messrs. John Spiers and Co., of Frederick Street, are just sending a big consignment of silver to South Africa. It is a large Christmas order, and is all contained in cases of the firm's own manufacture. Among the lines are some two dozen silver goblets, weighing from 20 to 50 ounces apiece. Some very fine mirrors, with sterling silver frames, as well as photograph frames to match. The cases of silver toilet requisites are extremely handsome. Each case, which is of "Cabinet" shape, contains two best bristle brushes, a mirror, and puff box. There are also some charming things in ladies' card cases, cigar and cigarette cases, and match boxes, and some very pretty cases of salts. Several specimens of the "new patent blotter," which is also made of sterling silver, are also to accompany the rest of the things. This is a very handsome adjunct to the writing table, and will undoubtedly become much sought after, both at home and abroad.

There is very little upon which to comment in the jewellery trade this month. Manufacturers are really busy, for factors have been giving out very good lines in view of the good Christmas season, which is confidently expected after the splendid harvests we have had, and the general improvement in trade consequent thereon. As regards new patterns and new styles, nothing yet has been found of a particularly striking nature.

Nothing has yet arrived from Paris, for although there are enormous quantities of diamonds displayed there, I hear that the display is at the expense of design. It was epigrammatically put to me by one jeweller as being "all diamonds, no design." This, like all epigrams, is not all the truth, but at all events, there must be some truth in it.

Mr. B. W. Westwood, of Warstone Lane, reports an improvement in general business, and Messrs. Henry Griffiths and Son, of Warstone Lane, makers of gold and silver thimbles, pencil-cases, eye-glasses, and every description of gold and diamond jewellery, are well employed in general lines.

Messrs. Deakin and Francis, of Regent Place, manufacturing jewellers and silversmiths, report an increase of business, as does also Mr. D. Beesley, who is well employed on bright and coloured gold chains. Messrs. Ball, Brothers, of Regent Parade, are steadily employed on their usual lines.

Messrs. Purdom and Stokes are just introducing to the trade their "Easy-fitting 'W' or 'saddle-nose' spectacles" with 2, 2$\frac{1}{8}$, 2$\frac{1}{4}$, 2$\frac{3}{8}$, and 2$\frac{1}{2}$-inch centres, and in connection with these they issue a case containing a series of frames, so that opticians can fit their patients from actual specimens. These boxes of frames cost about 30s. each, and contain six pairs. With the box is issued a card, which we copy below:

Centres, 2, 2$\frac{1}{8}$, 2$\frac{1}{4}$, 2$\frac{3}{8}$, 2$\frac{1}{2}$-inch.

A Bridge $\frac{1}{4}$in. above central line of joints, and $\frac{3}{16}$in. forward.
B ,, $\frac{1}{4}$in. ,, ,, ,, ,, flush with front.
C ,, level with ,, ,, ,, ,, ,, ,,
D ,, ,, ,, ,, ,, ,, ,, $\frac{1}{8}$in. inward.
E ,, $\frac{1}{8}$in. above ,, ,, ,, ,, flush with front.
H ,, ,, ,, ,, ,, ,, ,, $\frac{1}{8}$in. forward.

By means of this card a pair of spectacles may be ordered by telegram, thus, "Send 238 B Hook, plus 275 cyl. axis 130."

To opticians this should be of great use, and the firm are also adopting the system for ordinary spectacles.

Mr. Geo. W. Thompson, of Warstone Buildings, Warstone Lane, reports business in spectacles and general optical goods to be fairly brisk. He has just consigned several cases of field glasses, telescopes, and toy engines to New Zealand and Brisbane. Mr. Thompson makes a speciality of the model engines which he manufactures in very considerable quantities. He is now working up to his full capacity, and he expects he will not be able to complete the orders he now has for the Christmas season in time. In the spring he will make considerable alterations and enlargements to his premises, and will then be better able to cope with orders which he receives.

Mr. E. J. Adams, Junr., of 84, Great Hampton Street, Birmingham, exhibits at Bingley Hall his new Photograph View-finder, which is a neat little instrument which should be used by every photographer, as by means of it the necessity of a focussing screen and cloth is obviated. It will suit any camera, and can be used either for portraits or views. It is highly effective when used in instantaneous photography. It is very small and portable, and may be carried in the waistcoat pocket, and when used it is fixed on the front of the camera, and the view or portrait is seen in reduction on the back; it is supplied either with screw or with flat side. Another novelty exhibited by Mr. Adams is the registered "Multum in Parvo" letter weighing spring balance and postage stamp holder. This cheap little invention is very useful, as it is so small it may be worn as a locket on the watch chain or chatelaine. The correctness of it is guaranteed, and all who are puzzled to know what stamps to put on a letter need puzzle no longer.

Looking round the Exhibition the other evening I was struck with the exceedingly pretty appearance of Mr. E. Bombois' exhibit of Algerian lamps and candle shades. These lamps and shades are made of brass, and are jewelled with large cut glass crystals of different colours. The lamps are fitted with brass chains for suspension from ceiling, and are made in two designs of various sizes, the prices of them ranging from 8s. 6d. to 75s. each. The candle shades, which are constructed to go down as the candle burns and shortens, are also made gilt or silvered to match the candlesticks with which they may be used. Other designs besides those shown at the Exhibition may be seen at Mr. Bombois' London show rooms, 3, Robin Hood Court, Milk Street, E.C.

Following the lead of Birmingham, Edinburgh is next year to have an Electrical Exhibition, and meetings of the Executive Committee have already taken place. The guarantee fund is already over £10,000, and the remainder is being rapidly subscribed. The ground for the Exhibition has been rented at Merchiston. The general manager is Mr. S. Lee Bapty, who has prepared a draft prospectus report for presentation to the Council.

Mr. Albert Brunet, of 28, North End Road, London, S.W., has a nice show of Parisian jewellery at stand 148, chiefly consisting of brooches and chains in oxidite, nickel, imitation old silver, and some pretty things of moonstone.

Industrial Art in the Loire.

THE United States Consul at St. Etienne, in his last report, says that a society was then being formed there under the name of "Société d'Art et d'Industrie de la Loire," with a view to developing the commerce and industry of the department of the Loire, and furnishing its artisans with the means of extending their instruction in the trade to which they may belong. For this purpose the society is to establish at St. Etienne a combined museum and library, containing works of industrial art, models (either original or in the shape of reproductions), drawings, engravings, photographs, and books, all of which articles will be selected with exclusive reference to the existing industries of the department. Annexed to the library museum will be a bureau of commercial information, in which will be found for the use of merchants and manufacturers such documents, foreign as well as French, as may be of interest to them. It will also contain all information sent by consular agents to the French Ministry of Foreign Affairs, and by French Chambers of Commerce established in foreign countries, &c. The Society will further establish a bureau of industrial consultation, where the members will receive advice as to the improvement of their looms and other machinery, and where also such plans, models, and designs as may be submitted to the society, will be corrected free of expense.

The head-quarters of the society are to be at St. Etienne. Branch societies will be established at the centres of population of the department, as at Roanne, Montbrison, St. Chamond, &c., and through these branch societies application for books and models from the library museum at St. Etienne will be made.

As regards the organisation of the society, in the department of the Loire two artistic branches of the Loire predominate, that of the ribbon trimmings (*rubanerie passementerie*), and that of arms; these constitute the two first sections of the museum. The ribbon trimming section, in the division of patterns, will contain the most remarkable samples of the workshops of St. Etienne, and of the other centres of production, manufactured during the 18th and 19th centuries. Connected with these samples will be a collection of silks and other textile fabrics of European, Chinese, Japanese, and other Oriental countries; embroideries of all styles and periods; pictures of flowers, both native and exotic; sets of various *motifs* of decoration and ornamentation, &c. This collection is intended to serve to manufacturers and their designers as elements of technological study of inspiration in originating new designs. All these articles will, on demand, be sent to the houses of members of the society.

In the commercial division will be found samples of all the productions of the day of foreign manufacturers, with indications of the prices for which they are exported, &c.; and these samples may be likewise borrowed by the members. The museum is also to constitute a kind of exhibition of weaving, in forming a collection of all the original "types," old and new, of the looms and other machinery employed in the entire world by manufacturers of ribbons and trimmings.

As regards the second section, that devoted to arms, it is said that the Museum of Artillery, at St. Etienne, offers already a considerable collection of models, which, through galvanoplastic and other reproductions of the originals of the museums of artillery at Paris, Cluny, Moscow, Madrid, Turin, &c., may be rendered easily, and at little expense, very complete. Joined to these models will be photographic reproductions of pictures representing hunting and shooting scenes, of pictures of animals, and of everything useful to the designers and engravers of field sport. The commercial division of this section is to be organised on the same principle as that of the first section. Specimens of new foreign arms will be carefully looked for, and collected as soon as they make their appearance in the market.

The third section is devoted to iron industries. Consul Malmros says that a prejudice, which, fortunately, is now dying out, has hitherto classed articles of ironmongery and of locksmiths' work, as not belonging to the artistic industries. This, he states, is an error not shared by the French and Germans. The latter have established art schools for articles of ironmongery at Remscheid and at Iserlohn, and they have given a considerable place to works of the locksmith in their art museums at Berlin, Nuremberg, Munich, Dresden, and Hamburg. This section is to be organised on the same principle as the first two sections, and will contain typical models and specimens of all foreign, especially German, manufacture.

There will be three classes of subscription to the society—First, by members called founders (*membres fondatures*), fixed at a minimum subscription of 100 francs; second, ordinary members, minimum subscription, 25 francs; and third, associate members, minimum subscription, five francs a year.

In conclusion, Consul Malmros says, "The plan of this *Société d'Art* is excellently conceived, and well worthy of imitation by other localities, in which industries admitting the application of art to them are carried on. It is significant of the progress made in such industries by other nations, and of the danger threatening from their competition, that even in St. Etienne such an institution as this library-museum should have become a necessity. For here, 300 years of work and experience have developed a race of artisans, in whom superior manual dexterity and delicacy of taste seem to have become innate, and one can hardly avoid the conclusion that no centre of industrial art can dispense with a museum, if in St. Etienne it is found indispensable for the further improvement of its workmen. That a museum of art applied to industry is the best means to complete the education the workman has received during his apprenticeship and in technical schools, there can be no longer any doubt."

A Curious Old Clock.

OLD relics turn up now and then in most unexpected places. Among such is the astronomical clock at Hampton Court Palace, one of the most curious time pieces in England, writes a correspondent of the *New York World*. An old inscription indicates that it was made for Henry VIII. in the year 1540. The designer is not known, but is supposed to be the famous astronomer, Nicholas Gratzer. About three years ago it was discovered among some rubbish in a shed, where it had been for half-a-century, and was restored by the Secretary of the Board of Works. A legend connected with it is that if a resident dies it stops. The dial consists of three copper discs of different sizes, with a common centre, but turning at varying rates. The smallest disc is 3ft. 3½in. in diameter. In its centre is a projecting globe, painted to represent the earth. The larger part of this disc is divided into four parts, and its outer edge is divided into twenty-four spaces. These represent respectively the quarters of the moon, and the hours that it crosses the meridian, and they are indicated by a small red arrow, painted on the second disc, which always points to the quarter in which the moon may happen to be.

The second disc is 4ft. 1½in. in diameter, but only the outer rim can be seen. That is divided into twenty-nine spaces, numbered from right to left, which represent the moon's age in days. From between the numbers one and twenty-nine is a pointer which marks on the outer disc the time of the day and the night as it passes the twenty-four Roman numerals, two sets of twelve painted on the stonework, within which it revolves.

The third or outer disc, which is 7ft. 10in. in diameter, has painted upon it several sets of concentric circular spaces, first the names of the months, then the days of the month (only twenty-eight for February), next the signs of the zodiac, each zodiacal space being divided into thirty degrees, and on the outside of this disc a circle divided into the 365 days of the year.

The weights that are used to run the clock have a drop of sixty feet, and it takes half-an-hour once a week to wind it. The clock is set in a stone frame about fifteen feet square, with the badges of Henry VIII. above the portcullis, and fleur-de-lis and the rose, and his initials.

Half-hours with our Manufacturers.

IV. John Round and Son, Limited.

THE average Sheffield silver and electro-plate manufactory is very like—if we may be permitted to compare things lay with things ecclesiastical—one of our old parish churches, inasmuch as it is the product of various dates. The outlines of its history may be read by the intelligent visitor as he wanders from the low and stuffy workshops of half-a-century ago along narrow tortuous passages to the spacious and well lit showrooms of to-day.

The works of Messrs. John Round and Son, Tudor Street, Sheffield, are no exception to this rule. The older portion has the appearance of having been formed by the gradual incorporation of contiguous properties. Doorways have been knocked through and passages formed as the business of the firm has expanded. Finally there seems to have come a period when this process was deemed too slow, for the visitor, passing through a doorway, finds himself in a portion of the works which has evidently been built upon a plan. The passages are wide and spacious, the ceilings of the rooms are high and the various appointments are in the best style.

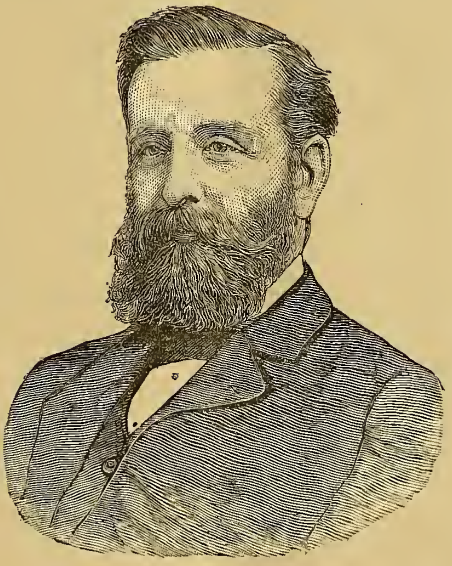
The story thus suggested has its details filled in as we wander about under the conductorship of Mr. W. H. Rhodes, one of the managers, who has kindly undertaken to introduce us to Mr. Ridge, the head and soul of the concern.

The genesis of the firm of Round and Son we find to be as follows:—

Early in the "forties," John Round came from Birmingham to Sheffield, and joined that numerous colony of "Brums" whose sing-song "twang" is so easily distinguishable from the more vigorous Yorkshire of the Sheffield silversmiths.

Mr. Round was by trade a spoon and fork filer, and he found employment in the works of Messrs. Hutton and Sons, who then carried on business in High Street.

He cannot have remained there very long, for in 1847 we find that he took a small house with a workshop attached, in Tudor Street, the site of the present works, and commenced business on his own account. This, of course, was only in a very small way, for the whole of the work seems to have been done by Mr. Round and the members of his own family.



JOSEPH RIDGE.

For the purposes of buffing and finishing, power was hired in Eyre Lane, a steam engine even of the smallest size being quite outside the resources of the new "firm." The venture, however, proved successful.

Mr. Round's goods, at first confined to spoons and forks, acquired a reputation for excellency of workmanship and gracefulness of design. Workshop was added to workshop, and Mr. Round gradually rose from the statue of a "little mester" to that of a full-blown manufacturer.

In course of time, his son Edwin was received into partnership, and the firm henceforth went under the title of John Round and Son.

The rapid development of Messrs. John Round and Son's soon had demands upon it for other classes of goods, adding department after department, until its comprehensiveness is such now as to take into itself the manufacture of silver and electro-plated hollow ware goods in such variety and style as may not easily be surpassed by any other firm in the country. Presentation and competition plate is a feature that has done much to spread the name of this celebrated firm. Its silver and plated cutlery, with the manufacture of trowels, spades, and mallets, for memorial stone laying, has reached such proportions as to find few rivals. Steel table cutlery in its various kinds is also manufactured upon the same premises—ivory, stag-horn, etc., with cased beef carvers of commendable excellence, and within the last few years has been added and developed in a specially artistic manner the manufacture of electro-plated Britannia metal goods, so that in these days a customer furnishing need not leave the manufactory until he has completely covered his tables with dinner, tea, or dessert services, from the tiny salt spoon to the massive centre-piece.

In July, 1874, the concern was formed into a limited company, Mr. Henry Pawson, Mr. Joseph Gamble, and Mr. J. W. Barber being the directors. A certain number of shares were allotted to Mr. John Round in return for the use of the name, but he never afterwards took an active part in the business. Both father and son are now dead, but their names are perpetuated in a business that has attained proportions which neither of them probably ever expected, and which has pushed its way into the front rank of manufactories of silver and electro-plated goods.

Having thus briefly sketched the origin and rise of the company, let us now proceed on the lines indicated by the title of this series of articles. But here we are met with a difficulty. The name of Mr. Ridge has already been mentioned as being virtually the brain of the corporate body of John Round and Son. Yet Mr. Ridge is a man who has very few half-hours at his disposal. In point of fact, to have half-an-hour with Mr. Ridge, one must be content to take it in instalments. Said he, the first time we dropped in, "I have not much time to devote to you this morning, but there is Mr. Rhodes here—he knows as much about it as I do—besides, you are quite welcome to come in at any time, when we shall always be pleased to show you anything new."

The first thing that strikes one in connection with Mr. Ridge is his energy, and the next his administrative capacity. He deals with his men firmly, but by no means arbitrarily. The result is a well-ordered works, where the leakage inseparable from lax management is small, and the very utmost is got out of everything and everybody. Rambling through the works one is struck with the fact that on the present site there is no room for further expansion.

There has evidently once been a quadrangular space in the centre, but this has been so much encroached upon by the extension of the surrounding workshops and offices, that there is now barely sufficient room for the carts which bring the fuel for the engines to back in and deposit their loads. That this is a matter which will have to be dealt with in the near future is evident from the scene of intense activity which presents itself within the works. The first thing which an expert looks for in visiting an electro-plate manufactory, is an indication of the relative *status* of the place, because the size of a concern is by no means a criterion of this. Whatever the lay public may think, the trade knows very well that there are silversmiths and silversmiths.

We do not go far through the works of J. Round and Son before coming to the conclusion that the firm stands high up in the social scale. The general air of respectability and intelligence which characterise the work people, and the general excellence of the work they have in hand, go far to prove this.

Our first visit was to the plating shop, which, although below the level of the surrounding streets, is well lighted.

It is a long apartment, the vats being arranged on the two sides with a bench in the middle to accommodate the articles operated upon. At one end of this bench is also the vat containing the gilding solution. The dynamo is near the end of one of the rows of vats. The ingenious economising of space, characteristic of the whole of the works, is noticeable here. At one end opens out rooms where the scratch brushes are accommodated, and also others where the preliminary operations in the process of plating are performed, the vat with the solution of cyanide of potassium being kept hot by a jet of steam from the boilers. Although there is no superfluity of space and the room is comparatively crowded, there is no confusion, and work goes rapidly forward.

Our next visit was to the engraving shop, a long narrow apartment especially constructed, lighted from one side and partly from the roof.

We were informed that it was the custom throughout the works to make one man in each shop responsible for the work done there. This is found to be a great saving of time to the administrative department and is found to work well.

We were here introduced to Mr. Rawson, the head engraver—a fine specimen of the Sheffield art workman. Several important pieces of work were lying about on his bench—notably the body of a charity cup for a football club in the Borough of Rotherham. It was covered with figures in the picturesque uniforms of the football clubs, and the drawing was perfect. Mr. Rawson also showed several specimens of engraving on ivory of such fineness of line that it was almost incredible, not only that it could be done with the naked eye, but that tools could be produced of sufficient delicacy to execute it. Here also were shown the designs for a communion service in solid silver, parts of which, in various stages of manufacture, were to be seen in different parts of the works. The wine flagon had four Gothic canopies, under each of which it was intended to place a statuette of one of the four evangelists.

From the engraving shop to the chasing shop naturally suggested itself as the proper course to take. By this time the tea half-hour, or "drinkin' time" had arrived, and the *Watchmaker* man had to be content with a view of partly finished work. The workmen, however, do not leave their workshops to partake of this meal, so that he had the benefit of any explanation which might be required. A glance round the shop showed that here, as in the engraving shop, the work being executed was of the better class. Bodies intended for raised chasing—with the marks of the "snarling iron" inside, proving that it was no trashy stamped work that was being touched up—lay ready for the pitch being poured inside, while finished work of a thoroughly artistic character was scattered about on the "sides."

We next looked into the casting shop, where Britannia metal "parts," as well as work of a more ambitious character, is being manipulated by women. In point of fact this is a kind of work which women can execute as well as or even better than men. Given good moulds, for which the die-sinker of course is responsible, there is no real difficulty about the process, which only requires a clear eye and a steady hand. This kind of work, however, was not so very long ago done exclusively by men.

And here we may interpose with a remark upon the metal used in this shop, namely, Britannia, or white metal. The name used to conjure up visions of clumsy ornamentation and thick "parts." This is not so, however. The metal used now is much harder than was formerly made, and this owing to a larger admixture of copper in its composition.

Thus it comes about that the cost of the best Britannia metal and German silver is not as great as it was. This metal is largely used in the making up of some of Messrs. Round and Son's specialities, to wit, paraffin lamps. Some of these are of a highly artistic character, and your representative would never have guessed that they were made of Britannia metal had he not been told. The parts however, which require most strength, are still made of German silver.

A glance in at the buffing shops showed the girls in the act of knocking off for tea. In their white over-alls and red head-dresses, they looked a not unpicturesque, and certainly a very healthy lot. They are, however, understood to make no pretensions to over-refinement of manners, and, as compared with the burnishers, between whom and themselves there are no dealings, they may even be considered coarse. There was no symptom of this, however, when your correspondent looked in upon them. They work under the supervision of a male buffer, who is responsible for all the work turned out.

The spinning shop close by was found deserted of its occupants, who having finished their tea, had probably gone down to the archway to smoke their pipes. Their work, however, was lying about where they had left it—cups and "bodies" of various sorts all worked out of the flat. He saw no cracked or "rokey" articles, in spite of the extent to which the metal had been turned up. When asked whether this was accomplished by heating the metal before manipulating it, our guide replied, "Oh no, the speed at which the 'chucks' revolve heats it sufficiently for our purpose."

There was only time for a cursory glance into the hammering and making-up shops, which had both the look of orderly disorder so characteristic of the whole place.

Our visit on this occasion was brought to a close by an inspection of the burnishing and finishing room. Here everything is focussed, so to speak, the productions of every part of the works having of necessity to pass through this apartment. A good opportunity is therefore afforded for forming an idea as to the variety of articles produced by the company, and the extent of their business. Presentation plate, challenge cups, soup tureens, and so on down to spoons and forks are littered about or being put into cases.

There seems to be a rage just now for putting almost everything into cases. Candlesticks, in spite of the axiom about putting a candle under a bushel, are now often put into elaborately got-up cases. The Americans are credited with having effected a sort of revolution in the cabinet case trade. Formerly the silk lining of a case was of one colour only; now, however, it is often of various harmonious colours, and some are thus made to look very effective.

Some days after this visit we received an intimation by telephone that there was something specially worth seeing in the show-room. Arrived there, we found that one Football and one Bicycle Challenge Cup, the parts of which were seen in an unfinished state during our former visit, had been got out of hand, and were on the point of being packed up. They were going to Rotherham and Torquay respectively, and were really splendid specimens of art workmanship. One hundred and twenty ounces of silver had been used in the making of each of them. The handles in each were beautifully modelled, and altogether two finer specimens of the silversmiths' art it would be difficult to find.

Our attention was also drawn to the Communion Service, now finished, glimpes of which had been previously caught in the former visit. The figures were in their places under the canopies, and the lid of the wine flagon was surmounted by the bird which was supposed to feed its young with its own blood. The whole service was gilt and had a most gorgeous appearance.

In conclusion, we must remark upon the pleasure which this visit to the works of John Round and Son afforded us. We were received by all without fussiness, but with the easy courtesy of people who had confidence in themselves. The high standing to which the Company has attained in recent years we heard attributed to Mr. Ridge, this encomium being passed upon him by those who have the best means of attesting his merits.

The Watch.—In good old days who every night kept pious housewives free from fright and led their husbands home when tight? The watch. What is the small boys hope and pride, who when his mother leaves his side is robbed of it and cash beside? The watch. Who on the steamship far at sea with never sleeping scrutiny prevents all perils that may be? The watch. What is it that the good and true keep on themselves the long year through? And keep in their vest pockets, too? The watch.—Wm. E. S. Fales in *Texas Siftings*.

Long Terms and Accommodation Bills.

Part 1.

To the majority of business men, engaged in other trades, who get occasional glances into the working of our own trade, it is a matter of great surprise to find such excessively long terms obtaining therein.

And without exception do all such unprejudiced observers (men of high standing and keen business ability in their own spheres) denounce the system as a source of difficulty and of danger to our trade at large.

Doubtless, in a dreamy sort of way, this opinion would be endorsed by all the respectable members of our trade, whether shopkeepers, factors, or manufacturers; but, unfortunately, little or no further notice would be taken of the matter beyond this expression of opinion. We seem to have settled into a state of apathy on this subject, taking the present condition of things for granted, without enquiring as to their origin or considering their advisability. It will, perhaps, be worth our while to give a little attention to the growth of our present credit system, so that we may discover, if possible, how far it fulfils a useful purpose, and where and to what extent, it oversteps the bounds of usefulness.

The simple first principle of a business transaction is as follows:—A man requires certain goods which another man has to dispose of. He selects what suits his purpose, pays at once the price agreed upon, and thus the matter is ended. Very good in theory, doubtless, and as a special retail transaction, admirable in practice also. But, obviously, such a ready money system is far too clumsy to meet the requirements of a constant series of business transactions. Where the relations of business involved a variety of items, large and small, often several such in one day, it were simply impossible to settle each one independently and at the time. Hence some system of credit accounts had to be introduced, as a matter of necessity, and for the purpose of facilitating business operations, and thus weekly and monthly settlements were adopted. Useful at first, and fulfilling a necessary purpose, this system has gradually become so much abused as to form at present one of the very worst features of our trade. It has brought with it from the past a long record of disasters, and it hangs over the future with darker and heavier menaces.

It is easy to conceive how this system has over-stepped its original usefulness. The temptation to buy recklessly, when once credit is obtained, appears to be one of the inherent vices of human nature. It is exemplified in all grades of income, from the merchant prince with his overwhelming wine bill, to the working man's wife and her overdue score at the huckster's shop. And surely the jewellery buyer is no exception to so universal a failing. So, large parcels were bought, immense stocks were accumulated, long accounts were run up. Then at the day of settlement, only partial payment could be made, and an extension of credit had to be arranged for, backed up by stupid excuses and vain promises.

Again, a tradesman, probably without any such reckless buying, found himself temporarily hard up and he too had to ask for an extra week or month. Thus the use speedily became an abuse, and that which had been at first a convenience, degenerated into an easy habit and a matter of course.

A further development of this pernicious mode was the giving of bills and promissory notes instead of cash payments; while its latest out-growth—unfortunately greatly on the increase during the last few years—is the dating forward of invoices to the next account.

Thus we see there is a constant and an increasing tendency to postpone the day of payment to the utmost possible limit. The facile formula "Three months after date" gradually (or rather rapidly) extended to four, six, and even nine months; and we take it that the *average* length of credit at present obtaining in the trade is about nine or ten months, while terms of twelve or eighteen months are by no means uncommon.

It is much to be regretted that such is the case. The facilities thus offered for careless trading, for stupid bungling, for actual dishonesty are enormous; in fact such a system is a pitfall to the too sanguine trader and is a potent temptation to him whose inclinations tend to roguery. In other directions its influences, though more subtle, are not less inimical to the interests of genuine trade. It offers the excitement of gambling in its uncertain developments, and it gives to the speculator an apparently fair chance of engaging in his risky hobby. Even where a tradesman is steady and careful and desirous of doing a straightforward business, he is too apt to be led astray by the luring possibilities of this long-winded system. The specious arguments of the vendor seem pleasingly true, "The very things that will be selling during the next few months," "Plenty of time to turn them into money before payment is due," "If you can't find cash you can give a bill—any length—suit your own convenience," Thus fresh liabilities are incurred, unmindful of those immediately pressing, or of others shortly falling due, for

> "The mind flies back with a glad recoil
> From the debts not due till to-morrow."

Of the actual disastrous results of this mistaken policy is it necessary for us now to speak? Need we recall the long list of failures during the septenary ending with the ill-fated Jubilee year, when crash after crash almost paralysed our trade? Let those who struggled through that weary and heart-breaking time decide as to what extent the system we have just been exposing was answerable for the magnitude of the losses sustained. We have no hesitation in affirming that seventy five per cent. of the money lost was directly due to the opportunities afforded, and the recklessness induced by the far too easy credit prevailing. Do we not remember only too well how in various instances a complete swindle was planned and carried to an (we had almost said successful) issue, simply on the lines of long terms? Have we not got, carefully hoarded up somewhere in the recesses of our cash box, sundry worthless acceptances for large amounts, which forcibly illustrate this? Again, can we not call to mind many a case in which a well-intentioned but weak customer has placidly drifted on and on under the false influences of this mischievous system with the only possible result, viz: difficulty and bankruptcy?

These, unfortunately, are not fancy sketches, but are drawn from a hard experience. We have all been through the fire and have felt its scathing results, and it is now time that we examined the causes which led to our former misfortunes, so that we may shun them in the future. If long accounts and lax settlements are responsible for so much evil in the past—and there is not the slightest doubt that they are—then it is for us, as business men, to prevent such causes operating in the future.

The matter resolves itself into two questions. First, is it possible to do without such long terms? that is, can we meet all the requirements of our business without them? Secondly, what better system can we adopt to successfully carry on the various branches of our trade?

Our answer to the first question is most emphatically Yes, we *can* do without such long terms; we *can* meet *all* the requirements of our business without them. They render us no real service, they give us no actual help. Their value is purely fictitious, their assistance is simply imaginative. They play a negative, not a positive part in the economy of business. They give a false sense of security to the trade, while actually tending to make it less secure. Looked at from an impartial standpoint it seems impossible to discover where the supposed usefulness of the system comes in. Probably at first sales may be forced, and apparently good business done by postponing the payment as far as possible; but when once business relations are established, the actual difference between paying to-day for goods had twelve months ago, or paying for goods just bought is simply nil.

And now, having found fault so freely, what wholesale remedy do we suggest? What line of action would we recommend to compensate the evil effects as already noted? This is a matter, doubtless, that requires long and careful consideration, as it is far easier to upset existing arrangements, though faulty, than to elaborate perfect ones to take their place. We *have*, however, given careful consideration to this matter, and have full confidence in asking the equally careful attention of the trade to our suggestion, which is as follows:—*We would have all accounts rendered and collected (or remitted)* MONTHLY, *with a fair* CASH *discount, say five per cent.; and we would totally abolish all bills and such like instruments.* Simple enough in all conscience, and yet probably its very simplicity would prove its greatest deterrent. Just consider what immense benefits would accrue if some such system were adopted. The whole trade would immediately rise to a higher level, its stability would be manifest, its safety beyond doubt. The very possibility of bankruptcy in its worse forms, with which, alas, we are so thoroughly acquainted, would be removed from amongst us. The opportunities for, and hence the temptations to, systematic swindling would be reduced to a minimum. There would not be length of time enough for the weak and thoughtless trader to get involved in unintentional difficulties.

We would make this reform absolute throughout the entire trade, retailer, factor, and maker, and under its strengthening influence all possible—that is, all genuine—business would be done, while all transactions of a speculative and forced nature would be well avoided.

The complete conduct of business under such conditions is quite possible, and when once properly adopted they would work infinitely better than do our present multifarious and erratic arrangements. That it is possible is evidenced by the fact that some of our large merchants have for years carried on their trade entirely with weekly and monthly cash payments.

There is one exception we would make to this otherwise inflexible rule. In the case of goods bought for shipment, when several weeks must of necessity elapse before they can be placed on their destined market, it were only fair that the buyer should have a sufficient length of credit to cover this time of transit. We would therefore suggest that all shipping accounts should be extended, by individual arrangements, according to circumstances, to meet the special requirements, but in no case should the credit allowed exceed three months upon a monthly account.

Doubtless there will be many objections to and arguments against the universal adoption of any such short credit system. But these will, we anticipate, form rather illustrations of the difficulty of transition than actual reasonings against its advantages provided it were once in force.

Herein, undoubtedly, is great difficulty. The process of conversion must of necessity be hard, and would fall with undue severity on some. The best means to use would have to be carefully elaborated and consistently enforced.

Of this, however, we are quite sure—some change will have to take place, some more business-like method will have to obtain, if our trade is still to continue worthy the attention of men of high commercial ability with brains and capital to invest. The good old times, when prices were high and competition low, have passed away, and under the present state of things, with those conditions exactly reversed, the jewellery trade is far too risky to invite new ventures. There may yet be a good future for it with a revised code of credit, when even at the low prices and cut profits as at present prevailing, a fair return may be obtained for energy and money expended.

MANUFACTURER.

Birmingham, *August*, 1889.

THE PLATE DUTY.—Among the passengers by the Flushing boat to Queenborough one night last month were two German ladies, a mother and daughter, on their way to London. Their luggage was overhauled at Queenborough Pier by the Customs officers, and in their boxes was found a quantity of silver ornaments, which the passengers assured the officers were all the silver they carried. The officers, however, searched further, and discovered a large quantity of articles in silver, considerably more than the prescribed allowance for passengers. The ladies were detained on a charge of smuggling, until a gentleman from London was summoned to their aid, and he paid the duty, which amounted to over £109.

Why Sixty Seconds make a Minute.

WHY is our hour divided into 60 minutes, each minute into 60 seconds, &c.? are explained by Prof. Max Müller as simply and solely being because in Babylon there existed, by the side of the decimal system of notation, another system, the sexagesimal, which counted by 60's. Why that number should have been chosen is clear enough—and it speaks well for the practical sense of those ancient Babylonian merchants. There is no number which has so many divisors as 60. The Babylonians divided the sun's daily journey into 24 parasangs, or 710 stadia. Each parasang or hour was subdivided into 60 minutes. A parasang is about a German mile, and Babylonian astronomers compared the progress made by the sun during one hour at the time of the equinox to the progress made by a good walker during the same time, both accomplishing one parasang. The whole course of the sun during the 24 equinoctial hours was fixed at 24 parasangs, or 720 stadia, or 360°. This system was handed on to the Greeks; and Hipparchus, the great Greek philosopher, who lived about 150 B.C., introduced the Babylonian hour into Europe. Ptolemy, who wrote about 140 A.D., and whose name still lives in that of the Ptolemaic system of astronomy, gave still wider currency to the Babylonian way of reckoning time. It was carried along on the quiet stream of traditional knowledge through the Middle Ages, and, strange to say, it sailed down safely over the Niagara of the French Revolution. For the French, when revolutionising weights, measures, coins, and dates, and subjecting all to the decimal system of reckoning, were induced by some unexplained motive to respect our clocks and watches, and allowed our dials to remain sexagesimal—that is, Babylonian, each hour consisting of 60 minutes. Here you see again the wonderful coherence of the world, and how what we call knowledge is the result of an unbroken tradition of a teaching descending from father to son. Not more than about a hundred arms would reach from us to the builders of the palaces of Babylon, and enable us to shake hands with the founders of the oldest pyramids and to thank them for what they have done for us.

A "CAT'S EYE" SEVEN POUNDS IN WEIGHT.—A correspondent of a Ceylon paper writes:—I was talking to a well-known gemmer who hails from the other side of Galle, and he says that he has seen the large cat's eye, the finding of which was recently recorded. It is the finest stone he has ever seen, he says, and he doubts if a better one has been discovered anywhere. It weighs 6lbs. and 6 rupees, and is of about the size of a 7-lb. weight. The finder, he gave me to understand, is a Moorman, who for a very long time found his digging very unprofitable; but at length his perseverance was rewarded by the finding of a cat's eye which realised over £1,000 sterling. Shortly after this he came on another which brought him in over £2,000, and then he fished up the gigantic stone about which so much talk has been made. He has been offered £19,000 for it by a syndicate of Moormen, but he declines to part with it at that figure, saying that if he liked he could cut it up into about 40 small pieces, and sell each piece for £1,000. A little time ago he found a larger cat's eye than this one, but the ray was not good, so that it is nothing like so valuable. Cat's eyes, my friend added, are continually being come upon which fetch from £40 to over £100, and a syndicate has been formed in Galle to carry out gemming operations there. The stones are all found on the wash-soil at a depth of from 12ft. to 16ft., and a license to gem can be obtained for only Rs.10. The discovery of the mammoth stone has had the effect of causing a great number of Moormen to make their way to the place, until they are now so numerous as to warrant one in saying that every bush grows one. They pop out suddenly, he says, from behind a hedge, always with the same inquiry, namely, "got any stones to sell?" Altogether it looks as though gemming is flourishing "down South."

The Manufacture of Cases for Jewellery and Plate.

WHEN admiring a fine silver tea or coffee set, or a pair of fish carvers, lying so snugly in their cases of satin, velvet, and morocco, it seldom strikes one to think of the importance of these said cases, and of the considerable industry which they represent in a place like Birmingham or Sheffield. Not only does a well-made and well-finished case enhance the appearance of any article which it may contain, but it also adds to its value, and without it the articles for which it is made would become tarnished and worn. In the case, however, it is safe from all outward circumstance, and when not in use may lie there with perfect safety as to its condition.

Considering the importance of this branch of the jewellers' and silversmiths' work, it therefore occurred to me to visit the works of some well-known manufacturer of jewellery and plate cases and see how the things are actually produced. With this object I called on Mr. John Spiers, the proprietor of John Spiers and Co., Birmingham, and asked him to show me over his new premises in Frederick Street, and he very kindly consented. For thirteen years Mr. Spiers has carried on his business at Ruby Buildings, Warstone Lane, but two months ago he removed to much more commodious and convenient works, where he is much better able to turn out the great number of cases which are required, with the utmost despatch, and this is a point of considerable importance.

First of all, Mr. Spiers pointed out to me, in an airy and well-lighted shop, a number of carpenters at work, cutting to the required shape the wood which is required for the groundwork of the case to contain the various articles sent to the firm to be fitted. Each case has to be made separately by hand, as almost each one is of a different shape and is required to contain a different article. Of course, there are a few regular things that are always in requirement, such as ring cases for half-a-dozen rings, or bangle cases for one or more articles. These are in constant demand and are of a pretty uniform pattern, and are always on hand. But the great bulk of the trade is in special shapes, and manufacturers of jewellery and silver ware send to John Spiers and Co. their unfinished article, which is given to the carpenter, who cuts out of the best, nice, soft deal a piece to fit it. Then the two are passed on to the next shop, where experienced girls are engaged in "upholstering," as it were, the wooden cases sent to them from the carpenter.

A very large and varied stock of velvets, satins, calfs, moroccos is kept, and from the rolls of these materials are selected the pieces of leather, and velvet, or satin, as the case may be, which will most advantageously display the article which is to be cased. This is given to one of the girls, and she forthwith cuts it out to the required shape, and with the aid of the glue-pot speedily covers up the wood, the leather outside, and the velvet or satin as a lining. She then passes it on to the next room where men receive the cases for finishing. Here they are fitted with gilt hinges, and catches or locks if required, and tooled in a similar way to that in which the bindings of books are tooled, and whatever gilding is required is also done in this room. The case is now complete, and the article placed in it to be returned together to the maker. Here the article is finished and polished, and placed once more in the case, and is then ready for consignment.

In this way cases for all kinds of watches and small clocks requiring cases are produced, as well as cases for rings, bangles, bracelets, and brooches; toilet sets, brushes, and mirrors; flasks and goblets; cigar and cigarette, and ladies' and gentlemen's card cases, communion services, tea and coffee sets, and medals, and in fact, all the innumerable articles which are produced in such centres as Birmingham and Sheffield, and which absolutely require cases before they can be packed up and consigned. Of course, in a business like this, where large quantities of valuable plate, jewellery, and watches are consigned to the care of the firm for the time being, it is a matter of considerable importance that proper measures as to the safety of such goods should be taken. Sometimes, Mr. Spiers informed me, he has as much as £2000 worth of diamond jewellery and plate in his possession requiring cases, and for this, while with him, he is quite responsible. He has therefore taken the precaution not only to insure very heavily, but also to have a large and well-built strong room in his premises in which he can place all the articles entrusted to his care, and thus ensure their safe keeping. This strong room is always well stocked, and I was shown, while there, a large number of gold watches and pieces of jewellery waiting for the completion of their cases. When in the office, a messenger arrived with eleven very valuable diamond bracelets from a firm whose name is very well known to readers of this journal. These were left with perfect confidence to the care of Mr. Spiers till such time as he returned them placed in their new cases. Mr. Spiers is making at the present time a large number of cases for watches. Last year cases for silver-plate ware were most in demand, for then jewellery was not so brisk. Now, however, it is looking up, and the firm is very busy in the manufacture of jewel cases.

The making of these cases is not a complicated and an intricate thing, but it is a matter in which skill and taste are required, and when we reflect upon the enormous number of the cases which are required year by year, the process of their manufacture cannot but be of interest to all those who are connected with the watchmakers', jewellers', or silversmiths' trades.

W. K. P.

Conant's Isochronal Clock.

MESSRS. TIFFANY & CO., of New York, are exhibiting at the Paris Exhibition examples of a new form of isochronal clock, the details of which are characterised by great ingenuity. This clock is the invention of Mr. H. Conant, who has worked upon the idea of performing mechanically what has hitherto only been done by personal observation, namely, taking the average indications of a number of timepieces, each of high excellence. To carry out this principle, Mr. Conant has originated a clock having a number of pendulums, each fitted with an escapement of the highest class. These escapements are so connected by the clock mechanism that a large and principal second hand shows constantly the average time indicated by the group of escapements.

The clocks at the Exhibition are constructed with pendulum escapements, although chronometer escapements could be as readily grouped and averaged. Mr. Conant has not exceeded four escapements in any of the instruments yet made, but if a still finer instrument be demanded, it is, he considers, entirely practicable to combine eight or even more. He claims that the elimination of error is always in proportion to the square of the number of pendulums; thus two pendulums would reduce the error to one-fourth, four to one-sixteenth, and eight to one-sixty-fourth.

Another point suggested is that in a group of pendulums in one instrument thus arranged each will have a steadier rate than when isolated. The tendency to synchronise with each other may exist, still Conant has been unable to make them do so, and he has found by careful observation that when there is a variation among the pendulums or rate, varying as much as fifteen seconds a day each, the clock will have a steadier rate, that is, if one pendulum gains half a minute a day, the next fifteen seconds, while the other two lose correspondingly fifteen and thirty seconds a day, the action of the clock will be more perfect, and its rate less liable to change than would be the case with a high-class one-pendulum clock, while also the ease of bringing the instrument to schedule time is much increased, for the instrument "minds its helm," being disposed to prefer to run on exact time.

The main dial of the clock is of standard style, being divided into twelve hours, and in addition to the regular minute and hour hands, there is a long sweep-seconds hand. There are four pendulums, each pendulum being of different length from any of its companions; they make respectively fifty-six, fifty-eight, sixty, and sixty-two beats each per minute. Each pendulum is represented on the dial plate by a small dial and a revolving hand, and these four dials are arranged in pairs according to the impelling mechanism, each pair indicating their average rate of progress in a small dial above them and below the main dial. This accounts for the presence of six small dials below the main dial, each having a small hand that completes a revolution in one minute.

The theory of this construction is that in a series of single-pendulum clocks whose time is not likely to be perfectly accurate, some will have a slower rate and some a faster, and yet for an average they may give perfectly accurate time. The best clock-makers in the world feel that they cannot undertake to warrant their constructions to run nearer than two or three seconds per week. It is well known that a general belief exists that clocks standing near each other and having varying rates will synchronise, one overpowering the other. This circumstance (see Reid's "Clock and Watchmaking," p. 385) for some time deterred Mr. Conant from the attempt to unite and associate a number of pendulums, fearing disastrous consequences to their timekeeping qualities. But although his first clock was made with four pendulums of equal length, he found the tendency to synchronise much less than was expected, and repeated trials to get the pendulums to do so failed entirely, although the rate came as near as two seconds a day of each other.

We are, unfortunately, unable to give illustrations of the peculiar system of gearing by which the average motion of the four escapements is obtained. Those anxious to learn further details of this system will find it excellently illustrated and described in *Engineering*, of September 6. There are three large principal wheels, the middle one of which receives the impulse, and from this, by means of a little planetary wheel, other wheels on each side are driven. The side wheels have two sets of teeth, one being bevel gear engaged with the planet wheel, while the other is on the periphery, and connects the side wheels with those on the arbors of the escape wheels. The former wheels are loose upon the supporting shaft, and this arrangement allows first one of the side wheels to move and then the other, as the escapements actuated by the motions of the pendulums allow. This also gives to the actuating wheel carrying the planetary gear a motion which is the average of the motion of the side wheels, and therefore any wheels actuated by these must have the same resultant. Therefore, a small wheel gearing into the central wheel must have a motion which is the mean of the motions of the two wheels connected with the escape wheels. But the ends of the shafts that support these wheels carry each a small second hand as seen on the left-hand part of the dial plate below the main dial, and the second hand carried by the shaft of the wheel which gears with the central wheel must indicate a passage of time which is the mean of those shown by the second hands on the shafts of wheels on escape wheel arbors. The three second hands on the lower right-hand corner of the dial plate are moved by another portion of mechanism, identical in every respect; and these two mechanisms are actuated by another mechanism, which is connected to and impelled by the wheel controlling the sweep-seconds hand; so that this latter must be moved at the average rate of the four second hands at the bottom of the dial plate. Without illustrations it would be useless to describe the somewhat complicated averaging mechanisms.

Propelling power is furnished by two weights at the end of two cords that wind upon drums in the usual manner. These act through a small train upon the intermediate wheels, engaging, through the wheel before described, the averaging mechanism.

The action of the works can be best understood by supposing the clock and every pendulum to be at rest. Now, start one of the pendulums, say No. 1; the second hand of that escapement will revolve once in a minute, while the large sweep-seconds hand will make only a fourth of a revolution in the same time. Now, starting a second pendulum will in no way affect the movement of the escapement of the first, but will impart a corresponding movement to the sweep-seconds hand, and that will revolve half a revolution while the second hands of the two escapements make one completely. A third pendulum started causes the sweeper to make three-fourths of a revolution in one minute; and when all the pendulums are in motion the clock is on its regular rate, and the time is measured correctly in seconds, minutes, and hours. The movement of the "sweep" being the resultant of the movements of the four escapements, must indicate an exact average of their motion.

The ordinary clock is constructed on the theory that it will have to be moved forward or backward at times to make it correspond fairly with the local time; but the clock now under notice, having its hands held in place by friction just the same, can be moved forward or backward without trouble or damage. In fine timekeepers and clocks attached to observatories, the regulation is by means of the second hand. And in places where a fraction of a minute or second is taken into account, a method of adjusting the second hand seems desirable. This clock has a mechanism by means of which the second hand may be moved forward or backward to bring it into any desired position, even to the fraction as small as a hundredth part of a second.

The whole of the mechanism in this clock is an exceedingly ingenious and (to clockmakers) novel means to an end, and an inspection of the various contrivances, including bevel and worm gearings, sleeves, &c., for obtaining the different actions, would give the modern clockmaker many a useful idea.

"Non-Magnetic" Watches.

WE are told, says a correspondent in the *Electrical World*, that electricity and magnetism ruin the watch, and as time is such an important factor in this rapidly moving age, there arises the serious question of What shall we do with our watches? In the operation of railways we must have *correct* and *reliable* time in the pockets of our employees, and as electrical appliances are invading all parts of train service, thus rapidly increasing the dangers surrounding train-men's watches, now, which way shall we turn for relief? In the late electrical exhibition in Chicago, I noticed the exhibits of the "Non-magnetic Watch" companies and the "Anti-Magnetic Shield for Watches," and on enquiring among them for information have got about this—each of the non-magnetic watch companies says about as follows of the others: "Their watch is not permanently adjustable;" "it will not hold its rating;" "they do not possess the secret of making alloys of metals from which they can make a good, adjustable, non-magnetic watch;" "*we* have the only true non-magnetic metal from which the watch can be made which possesses permanent time-keeping qualities;" "the anti-magnetic shield is not good for much;" or, "it is only a partial protection," etc., etc. I passed over to the "Anti-Magnetic Shield" exhibit, and was told there that "the shield will protect the watch from all magnetic influences to which the wearer would be subjected in any avocation," and that "the shield enables us to use the regular '*steel and brass escapement*' which has been proved to be the only permanently reliable material to be used in the construction of a watch, by the last fifty years' experience and experiment;" also, that "by the use of the shield, permanent conditions are created around the watch, and it thus utilises magnetism to improve the rate of the watch, and in this way a better rate is obtained from any watch, under any and all conditions, than could otherwise be obtained;" and further, "that the protection is *permanent and positive*." Next, I go among expert watchmakers and find expressions and opinions divided. Some say "it is a scientific impossibility to substitute soft or "non-magnetic metal" for steel in the watch, and get a permanent good rate from it;" "it may run well for a time, but will 'all go to pieces' sooner or later." Others say: "I think that they have got a non-magnetic watch which will keep time, but it has not been long enough in use yet to prove it." Some say of the Anti-Magnetic Shield: "It is of little practical use, and does not prove a full protection for the watch;" "magnetism is a mysterious force, and can never be controlled, and any one who says he can control it is a 'fraud,'" etc. Others say: "The shield is a perfect practical protection, and of great advantage to the watch," and "no watch should be carried without it;" "it is one of the greatest inventions of the age for watch protection," etc. Now, as "doctors disagree" in the watch trade, I turn to you for information on some points which come directly in your line, viz.: electricity and magnetism, and if not asking too much, would like you to give us some facts in this matter by answering the following questions:

First.—Does magnetism ruin a watch, or does it permanently injure its performance?

Second.—Does the "Anti-Magnetic Shield" protect the watch from magnetism?

Third.—If so, how does it do it? That is, on what scientific principle does it accomplish its mission?

Fourth.—Does it protect fully, or how strong a magnetic influence will it withstand in actual use among railway employees and electricians?

Fifth.—Are its powers of protection permanent?

Sixth.—Is there anything in its nature to injure a watch?

Seventh.—Or, on the other hand, is there anything in it to improve the rate of a watch?

It appears on the face of the evidence that *if* the "Anti-Magnetic Shield" does *protect* the watch, it is what we want, for it permits of the manufacture and use of what has been proven to be permanently *good* in the construction of a watch. When there is so much at stake, as in railway service, we can not afford to take "chances" on the "uncertain," and life is too short to experiment with what it takes years to prove. Let this generation prove by experiment, and then the next can enjoy it.

Clockmaking in the Black Forest.

FROM the Mannheim report on last year's trade of the district, it seems that this particular industry was very active during the whole of the twelve months, clocks on the American model being specially in demand for export purposes, as well as regulations for the home trade. The old-fashioned Black Forest clock in wooden case is said to be gradually vanishing. The prices for clocks in the American style (superior and extra qualities) are, however, depressed, and they have consequently in many cases deteriorated in quality. In the interests of the trade, some firms of repute continue to demand higher rates for their manufactures, and mostly succeed. These efforts, however, at effecting an improvement are defeated by a number of manufacturers, who continue to injure the trade by underselling, and by the manufacture of inferior goods. This state of things is certainly to be regretted—the more so since the demand has considerably increased, and with an improvement in quality, better prices could be easily obtained. As things are, what profits are made find their way chiefly into the pockets of dealers and agents. England continues to buy superior and fine qualities, English customers being extremely conservative in taste, and demanding a particular style of make and ornament, together with first-class workmanship, and these being requirements such as only firms with long experience can satisfy, a new man hardly ever succeeds in introducing his products into the English market.

To Make Platinum Adhere to Gold.—Platinum can be made to adhere to gold by soldering in the following manner: A small quantity of fine or 18-carat gold should be sweated into the surface of the platinum at nearly a white heat, so that the gold shall soak into the face of the platinum. Ordinary solder will then adhere firmly to the face obtained in this manner. Hard solder acts by partially fusing and combining with the surfaces to be joined, and platinum alone will not fuse or combine with any solder at a temperature anything like the fusing point of ordinary gold solder.

The Motive Force in Watches.

FOLLOWING a recent controversy in an English horological paper, a contribution from the pen of Mr. Oscar Perret, of St. Imier, in the *Journal Suisse d'Horlogerie*, will be read with interest: It should appear that this question were worthy of meriting the attention of all those engaged in watchmaking; nevertheless, this is far from being so, because it is the most neglected part, to such an extent, even, that many watchmakers do not trouble themselves at all to study the important works which this force produces, nor the parts that consume a portion of it. It appears that the mounter has no other duty to perform than that of imprisoning the spring within the barrel, lubricating it with a little oil of an inferior quality, without further troubling himself whether it runs without being cramped, or whether its force can develop as it should. This is due to the fact that the motive force labours under one disadvantage. Its motions cannot be seen and studied like those of the other moveable parts; were this so, one can be certain that it would be the object of greater care, and it would be more highly esteemed.

....It is rarely the case that the mainspring is examined; this fact is left to the good faith of the spring manufacturers, who may employ either steel of a bad quality or badly tempered; nor is any rigorous exactitude exerted as regards the height or thickness of blade, etc. Such as the spring is, it is delivered to the mounter, whose duty simply is to put it in place, regardless of the condition in which he receives it. It is not astonishing, therefore, that the greater part of these springs cannot but very imperfectly comply with the functions they are to discharge, and they become a source of imperfection to the watch, even when all its other parts are in fair order.

We have said that the mainspring performs a very important part; it produces a force which must be preserved as nearly intact as possible. The barrel being actuated by this force must, in its rotary motion, actuate an entire mechanism, and its energy experiences a diminution from one wheel to the other, so that when it arrives at the escapement a large part of the original force has been consumed by the many frictions of the depthing and pivots. Theory can with precision calculate this loss. To this may be still added the imperfections of construction, bad proportions, etc., which augments the intensity of the frictions and consequently requires more force.*

In order that the mainspring may comply with its functions passably, it must be capable of exerting a uniform traction force for at least twenty-four hours; and it would thereby favour the regularity of the amplitude of the balance vibrations, which is very important for the adjustment. But experience has taught us that it is not always an easy thing to attain this result, because it is well known that the manufacturers of steel have not yet been able to produce it with a regular force, and, consequently, springs with a uniform action in the same conditions are the result. Nothing, indeed, is more interesting than experiments on their action, to prove the irregularities produced by them, as far as their traction is concerned, even with springs of the same height and thickness of blade; this irregularity is a great defect.

I would like to call the attention of young watchmakers to one point: it is better in order to have more force of augmenting the breadth of the blade rather than its thickness, because less is lost of development, and the traction is much more regular from the beginning to the end of the performance—that means that the differences are not so great in the extremes; we have been able to observe this fact in a number of instances, and it is easy to prove the truth of the assertion by instituting experiments.

The friction produced between the coil blades during the activity of the spring is also of great importance, and becomes so much more injurious as the spring is out of truth, that is to say, when it unfolds to one side. It is fairly difficult to ascertain the origin of this, and the inquirer frequently loses much valuable time in ascertaining it. In the common watch, where the price does not, naturally, permit any very exhaustive inquiry, much could nevertheless be done towards ameliorating this evil.

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* Experiments instituted have demonstrated that the train (wheels, pivots, depthings), when in proper condition and lubricated with fresh oil, absorbs about 20 per cent. of the motive force.

The barrel must be free upon its arbor, like any other moveable piece in the watch ; the spring must be unconditionally free to develop with the greatest ease. The pivot holes and spring must be lubricated with a suitable oil of good quality. The repairer will frequently find a bad oil which rusts the steel and produces very injurious friction. One grave error very often found is that the core is too large.

We might say much on the question of the stop-work, because it must be acknowledged that many watchmakers do not at all inquire into the utility and duty of this little mechanism. It is often the case that repairers take it out altogether because they do not understand its functions. The stop-work has its well-defined utility, if it is kept in good order, and especially if it is made to comply with its functions, to wit, of utilising the turns which give the greatest equality in the tractive power.

By barrels for which no stop-work is used different stop systems are employed, and they are oftenest in bad condition, either by the space they occupy, the little quantity of solidity which they possess, or the disagreeable friction produced by them. We have been able to observe frequently that in many cases the collar-stopping contrivance hinders the spring from unfolding. Although certain kinds of collars do not produce this effect, and thus enjoy an advantage over other kinds.

As regards the quantity of force to be employed, there are laws governing this question in a rational manner. Generally speaking, there is more force than is necessary, but by reason of the want of care this excess is completely absorbed.

It is often asserted that the Americans use springs which are too strong. It is necessary to do them this justice, however, that their springs are proportioned to the barrel, and that if they employ large barrels their trains and escapements are in the same proportion. One difference to be noticed is that they have employed a much smaller but much thicker balance than we. In Switzerland the principle governs that the watch must go with the least possible force. It is an old principle which exerts its full value, especially for fine grade watches; but when it concerns watches "by the thousand," which must be manufactured at a very low price, the question is no longer the same. We must admit that the Americans have abandoned this principle for a very simple reason: Their watches, as well as our own, possess imperfections which would cause them to stop, and, above all, to go badly. Now, it must be acceded that these defects are compensated to a certain extent by the resistance of the motive power, which is much stronger than in our watches.

We do not desire to say that American horology is of a better quality, but we would rather speak of the advantages of their style of manufacture, because we know the time spent on watches with an unsatisfactory march. We know that the American watch possesses certain defects which we would not let pass without employing stop-work. We must admit, however, that in the manufacture of current watches the Americans thus possess an advantage over us. It may be objected that the wear is too great, but if the movement is worn out before the case, the former may be replaced at little expense.

On the Precipitation of Copper as Sulphocyanide in Assaying.

IN a communication to *The Journal of the Society of Chemical Industry*, Mr. Frank Johnson, F.G.S., F.I.C., Chief Chemist to the Tharsis Mines, Spain, gives some interesting details of experiments he has made on the separation of ores in assaying.

In the assay of copper ores and cupreous liquors it is almost invariably necessary to separate the copper from iron, zinc, or other metals as a preliminary to its estimation by any of the well-known methods.

This separation is usually performed by the use of sulphuretted hydrogen, hyposulphite of soda (sodium thio-sulphate), and occasionally of metallic zinc or iron.

During the last few years I have tried many experiments with the object of attaining a means of separation involving, for the assay, the least possible time, care, and manipulation. The result of my labours is the following method, which I have employed with success for many thousands of assays during the last four years, and which I find perfectly suited to the copper assay of Spanish pyrites and the copper liquors produced therefrom.

The ore is dissolved in any suitable acid, the excess of which should be mainly boiled off. The semi-fluid residue is diluted with about twenty times its volume of cold water and sulphocyanide of ammonium added to the extent of at least three times the weight of the copper possibly present. This will produce with the ferric salts a deep red colouration, then stannous chloride solution is added until bleaching ensues, and a liquid more or less turbid with precipitated cuprous sulphocyanide and the insoluble portion of the ore results.

I find 5 grms. a very convenient quantity to take of ordinary cupreous pyrites of ½ to 5 per cent. copper, and I add to the solution 5 cc. of ammonium sulphocyanide solution of 100 grms. per litre commercial crystallised salt. This quantity is safely sufficient for the precipitation of ·3 grm. copper, and is not enough when diluted by the assay to about 200 cc. to have any solvent effect on the cuprous sulphocyanide precipitated. If the colour of the ore or its solution indicates the presence of more than the above-named amount of copper, proportionately more sulphocyanide solution must be added.

Stannous chloride solution is made by dissolving commercial protochloride in hydrochloric acid to saturation, and is kept in a bottle containing rods of metallic tin. This solution is added to the assay immediately after the sulphocyanide. Being very strong, about 10 cc. are usually sufficient to discharge the colour due to ferric sulphocyanide.

A good close filter-paper is now required—perfectly free also from all traces of colour. Munktell's are the best of those I have yet tried, though other Swedish papers approach it closely.

The assay is filtered through a paper of 5 or 6 inch diameter which is washed with water containing about one per cent. of commercial hydrochloric acid—either partially, by one rinse round, or thoroughly, according to the intended subsequent treatment.

Before proceeding to describe the most convenient ways of estimating the copper, I may say that though it is safest to leave as little excess of acid as possible when evaporating the dissolved ore, enough must be left to allow of the complete solution of the saline products when water is added. In the diluted solution as much as five per cent. of free acids may be present, either sulphuric, hydrochloric, or nitric, though if much of the latter exists in the liquid, care must be taken that its temperature be below 100° F. when the sulphocyanide is added or a mutually destructive reaction would occur. Below 100° F. nitric acid may be present without further inconvenience than the production of a dark colour in the liquid after reduction with tin, due, I believe, to some compound of iron with nitric peroxide.

Returning to the assay—on the filter is caught the cuprous sulphocyanide, the gangue of the ore, and traces of stannic hydrate ; my usual routine is now to give one wash with acidulated water (one per cent. muriatic acid), allow that to run through, raise the filter-paper carefully by its edge, double and fold together, and drop the paper with its contents back into the dissolving flask, neglecting the traces of filtrate still clinging to the paper.

A dilute acid mixture is made of 1 part nitric acid, 1 hydrochloric, and 4 water ; 50 cc. of this are poured on the wet filter and the flask is placed on a hot plate to boil gently for about a quarter of an hour, when all red fumes should have disappeared and the paper have become quite reduced to pulp. About a quarter of the bulk may be evaporated, but not more, as it is essential to avoid the action of strong acids on the paper.

Ammonia is now added to the assay, and when fairly cool it is titrated with solution of cyanide of potassium, standardised preferably with copper dissolved, precipitated as sulphocyanide, and dissolved as above, for the best paper often produces a yellowish colour in the finished assay, more especially if the ammoniacal solution is left in contact with the paper pulp for a long time before being titrated. This colour is of no consequence if present also in the standardisation.

The above (with, of course, the usual precautions of cyanide assaying, viz., quantity of copper, acids, ammonia, &c., and temperature same in standardisation as in assays) is what I have found to be the quickest method of assaying poor ores and liquors containing zinc accurately to within about one per cent. on the copper present.

The solubility of cuprous sulphocyanide in the acid supernatant liquid is only 2 or 3 parts per million, and may be quite disregarded if standardisation of the cyanide solution be performed with an approximately equal quantity of copper similarly dissolved and separated.

In filtering a precipitated assay it is important to notice if the filtrate is perfectly clear. Frequently the first few drops passing are turbid, in which case this portion must be returned to the filter. Occasionally when washing the filter the dilution of the filtrate causes a separation of stannic hydrate, which, however, is easily distinguished from the turbidity due to cuprous sulphocyanide.

Cuprous sulphocyanide is soluble in hot dilute nitric acid, being converted into a cupric solution which even after long boiling contains cyanogen in a form which interferes with the cyanide titration, causing a much less amount of cyanide to be required than would ordinarily be the case. If, however, both nitric and hydrochloric acids be used, diluted in the abovementioned proportion with water, and the assay be boiled until all red fumes have disappeared, the resulting liquid can be safely assayed by the cyanide process.

The solution produced by dilute nitric acid alone cannot be assayed by electrolysis for the same reason unless it be first evaporated to dryness and strongly heated. The electrolytic assay can be applied to the solution in mixed acids by filtering from the paper pulp and evaporating with 1 or 2 cc. of sulphuric acid, taking up the residue with water and electrolysing.

I have performed the electrolytic assay many times prepared by the former and also by the latter of these means, and I find the latter very much more convenient. The paper pulp is reserved after washing and mixed with the liquid exhausted by electrolysis, ammonia being then added, the traces of copper left in the liquid and those in the paper pulp are estimated together colorimetrically.

The electrolytic assay with preliminary sulphocyanide separation has a good feature in that no arsenic, antimony, or bismuth are deposited with the metallic copper, nor have I ever noticed any blackening or other discolouration of the deposited copper even when left under the influence of the current for double the usual time, *i.e.*, two days.

Cuprous sulphocyanide is readily soluble in a solution of ferric sulphate, cupric salt, ferrous salt, and ferric sulphocyanide resulting. If this solution be acidified with sulphuric acid and a solution of potassium permanganate run in from a burette the red colour becomes lighter, changes to a brown, then to the blue due to cupric sulphate, and lastly a pink tint is produced by one drop of permanganate in excess. I find this reaction gives a very accurate and speedy means of assay. To apply it the following means are used :—

The paper, containing cuprous sulphocyanide and insoluble portions of the ore, is well washed, first once or twice with the dilute hydrochloric acid above mentioned, and then with hot water. The filter is raised, dropped back into the dissolving flask as before, and 50 cc. of acid ferric sulphate solution poured upon it. This solution contains about 100 grms. of ferric sulphate and 50 cc. H_2SO_4 per litre. The assay is slightly agitated to promote mixing of the contents of the paper with the solution. Permanganate solution is now run in until, after fresh agitation, the solution remains brown or olive green. It smells strongly now of hydrocyanic acid and is taken to a stink chamber, heated, and allowed to simmer for 5 or 10 minutes, when probably the red-brown colour will have partly returned. 200 or 300 cc. of cold water are now added and the permanganate titration completed. A good strength for the permanganate solution is 20 grms. per litre. If the first pink colouration be taken as the finishing point, though it is soon discharged, the accuracy of the assay is not affected by the reducing power of the paper pulp. This may easily be verified by treating a clear paper with 50 cc. ferric solution, diluting with cold water as before, and adding permanganate. I have always found one drop suffice to produce a transient pink colour. The chief inconvenience about this assay is the evolution of hydrocyanic acid during titration. Where one or two assays only are to be performed there is no trouble, as only traces escape from each flask before it is heated. The check assays, of which I have performed some dozens by this process, usually agreed with the electrolytic assay or with the weighed amount of copper introduced to within ½ per cent.

I have not as yet tried any experiments upon the application of this means of separation as a preliminary to the iodide assay, but I suppose that the liquid prepared as already described for permanganate titration, by careful washing and solution in dilute acid mixture, would, if nearly neutralised and sodic acetate added, yield a suitable medium for the iodide and hyposulphite assay.

No mention has here been made of reducing agents other than stannous chloride, as I have found no other approaching it in convenience. Sulphurous acid can be used if very little ferric iron be present, but otherwise it is very slow in its action. Hyposulphite of soda is for various reasons unsuitable.

In preparing the stannous chloride solution time must be allowed for the metallic tin immersed to precipitate any traces of copper present in the commercial salt. If the clear solution be then siphoned off it is easy to leave behind the black flocks adhering to the rods of tin.

In conclusion I have only to express my hope to have some criticism from those who may give a practical trial to the procedure here recommended.

A Jeweller's Dishonest Manager.

AT the Birmingham Police Court last month, before Mr. A. Hill (Deputy Stipendiary), Joseph Donlan, 20, 99, Little King Street, Hockley, was charged with stealing a large quantity of jewellery, the property of his employer Mr. John Millward Banks, manufacturing jeweller of Northampton Street, Birmingham. Dr. Showell Rogers, (Johnson and Co.), prosecuted, and Mr. Benbow Hebbert was for the defence. Dr. Rogers, in opening the case, stated that the prisoner entered prosecutor's employ in May last, and it was quite evident that since the commencement of his stay there he had been in the habit of stealing jewellery, and afterwards pawning the same with pawnbrokers in the vicinity. Latterly, however, he seemed to have extended his operations, and at the present time they could trace transactions with no less than 30 pawnbrokers. It should be said that after being at the place a little time he was given the important position of manager of the finishing department, and thousands of valuable articles passed through his hands. On September 5 he left his work without permission, and it had been found that on the same day he pawned a bracelet with Mr. Samuels, of West Bromwich. The latter was not quite satisfied with the prisoner's conduct, and insisted upon going with him to the address he gave, and which had since been proved to be false. While walking together prisoner admitted that the bracelet belonged to his girl. The pawnbroker pretended to believe him, and took him back to his shop, where he turned the key upon him. No less than 76 pawntickets had been found in his possession, and goods had been pledged to the extent of £22, while their real value was something like £80 or £100. Some difficulty would be experienced in making the charges, as no two pawnings had been made in one and the same day, and none of the goods purloined were over £2 in value. He thought perhaps it would be better if two cases were taken separately. Philip Lewin Samuels, 277, High Street, West Bromwich, was the first witness, and stated that he carried on business as a pawnbroker. On September 5, prisoner came to pledge a bracelet (produced) at his shop. He said it was his own, and asked for 15s. to be advanced upon it. Not being satisfied with his statement he called in police-sergeant Reynolds who took him into custody. Henry Shorthouse, attached to the West Bromwich police, deposed to receiving the prisoner at the station. He communicated with police-sergeant Baker, of Birmingham, and through him he was handed over to the authorities of this town. In the second case prisoner was charged with stealing a silver brooch. Richard Riley, assistant at Mr. W. H. Wood's establishment, in High Street, stated that on August 5 he pawned a brooch with them and received 4s. upon it. He gave his name as Walter Green, 25, New John Street. Sergeant Baker stated that from information received he went to the house of prisoner's father. In a room occupied by the prisoner he found the 76 pawn tickets mentioned above, including the one given with the brooch. In answer to a question put from the Bench, witness stated that papers relative to betting transactions had been found upon him. Mr. Hill: As I thought. I firmly believe that nine-tenths of the offences brought before me are traceable to this evil. A sentence of three months' imprisonment in each case was imposed. At the conclusion of the trial Dr. Rogers raised the question as to whether an order might be made entitling the prosecutor to claim the goods produced in court. Mr. Barradale: But the goods have only been produced in two specific cases. Dr. Rogers: Well, in the cases in which Mr. Wood are interested, I think we can claim them. The pawnbroker did not act with discretion in the matter, for all the goods were unfinished, and moreover, five separate lots were pledged by the prisoner in different names. Mr. Wood's assistant: Yes, but they were not all received by the same men. Mr. Banks subsequently admitted that, although the goods were technically unfinished, yet to the eye of anyone but an expert they would seem to be finished. The magistrate was of the opinion that the parties had better act in the manner usual under the circumstances, viz., each share half the loss. Mr. Hill then publicly thanked Mr. Samuels for his conduct in the matter, and was of the opinion, too, that no stigma was attached to the second pawnbroker mentioned.

American Items.

Can Anyone Beat This? asks the *Toronto Trader*.—The petrified arm of a pre-historic giant was unearthed recently on the farm of J. H. Wale, near Kearney, Neb., U.S. The hand was tightly clasped. A young son of Wale, while playing with the curiosity, broke off the fingers of the hand, and nine large diamonds of the purest water, and large as Lima beans, fell out. Wale will exhume the remainder of the giant's body. It is quite evident from the above that the able-bodied liar, who usually depends on the sea serpent for a living, has turned his talent in another direction.

Transmission of Registered Letters.—The changes in the transmission of money letters which came into force throughout the Canadian Dominion on August 1st are as follows: Registered matter will after this be sent by postal cars only, except where there are trains without clerks. Under the new system there will be secured a system of personal responsibility from the time a registered letter is posted until it is delivered to the person to whom it is addressed.

Two Large Clocks.—The Seth Thomas Clock Co. are now putting into the belfry of the St. Paul, Minnesota, Court House, the largest chiming clock in America. It weighs nearly six tons, and will tell the hours and quarters. It will sound the Westminster and other chimes. The dial is ten feet in diameter and self-illuminating. It taps four times for the quarter hour, eight times for the half, and twelve times for the three-quarters. Another great clock is that just built in the tower of the new depot of the Jersey Central Railroad in Jersey City. This clock was put up by the E. Howard Watch and Clock Co. Its glass dial is fourteen feet in diameter, the largest in the country. It is so enormous that the time can easily be discerned from New York City. Thirty-two electric lights illumine the dial at night.

Mardi Gras at New Orleans.—The celebration of Mardi Gras at New Orleans this year, says the *Watch Dial*, was of special interest to the jewellery trade. The subject chosen for illustration in the pageant was "The Treasures of the Earth." The following were the principal floats in the procession: Pearls—represented by three figures, reclining in shells: the car was festooned with strings of imitation pearls. Rubies—A grotto where a feast with wine and music was in progress. Silver—An immense fountain in full play, surrounded by five figures. Opal—Four fairies lingering on a highly ornamented pavilion. Crystals—Thousands of prisms showering from numerous cornucopias. Diamond—A brilliant pyramid, by which stood a beautiful figure resplendent with imitations of diamonds. Sapphire—A bower floored with blue crystals and hung with garlands of flowers, white swans occupying the space at either end. Ivory—A car decorated with elephant heads and tusks, occupied by an African chief fanned by slaves. Gold—A grotto lined with gilt, occupied by two fairies, and a garden with flowers, foliage, and verdure, all in imitation of gold. Amethyst—Eight figures reclining upon a car containing a bed of these gems, of tints varying from rich purple to light violet. Emerald—A sea in which rested an island spangled with imitations of this gem, and inhabited by fairies. Coral—A submarine representation of great beauty, representing a coral reef, with mermaids and huge shell fish. Onyx—Four large shells upon a bed of cactus and palm leaves, in each shell a nymph.

The Witwatersrand Gold Fields.

ON September 17 a paper on the Witwatersrand gold fields was read before the Geological Section of the British Association by Mr. Edward Bates Dorsey, Mem.Am.Soc.C.E., Mem.Am.Inst.M.E. In the early part of this year the author visited South Africa on business connected with railways and mining, which made it necessary for him to examine critically into the mining capabilities of the southern portion of the Transvaal, which section is called promiscuously the Rand, Witwatersrand, or the Johannesberg district. The mines there are more developed than those in any other part of the State. The author stated that as yet no developments had been made to indicate the vertical distance between the Main and Black Reefs. Many intermediate veins have been found between these two; some of them can be worked profitably. The monthly variation in the average yield per ton in the crushings reported by individual mines is caused by varying the proportions of ore from the different veins. A large amount from the rich leaders will cause a higher average, or a larger amount from the Main Reef will cause a lower average. The variation in the monthly yield is not caused, as many suppose, by change in the yield of vein; each vein is fairly uniform when compared to itself. At present there are about 800 stamps crushing ore from the Main Reef mines, crushing about 40,000 tons, and yielding about 30,000 ozs. of gold monthly, which gives an average yield of three-quarters-of-an-ounce of gold per ton of ore. This can be taken as the present average yield of the Main Reef, which will probably be largely increased as improved appliances for saving the gold and better management are adopted. Owing to bad mining and milling in many mines (though some are very well managed) the present average expense of mining and milling is probably 30s. per ton. Estimating the gold at its market value of £3 10s. per oz., this gives—average yield of ore per ton £2 12s. 6d.: less estimated expenses as now worked, £1 10s.; net profit per ton at present, £1 2s. 6d. This profit will probably be increased to £2 by saving more gold and economies in the working cost, resulting from better arrangement. These figures make the present value of each acre of ground underlaid by the Main Reef at an angle of 25° worth over £45,000 net profit, with a strong probability of being soon doubled as better work is done in mining and milling; this amount will also increase with the dip of the vein in consequence of increasing the tonnage per acre. The Black Reef vein is being worked in many places and has been traced for a great many miles. It averages 3ft. thick and yields in the "Black Reef" mill sixteen dwts. of gold per ton. The total cost of mining and milling this ore is less than 20s. per ton. The Zurr-Bult vein averages 3½ft. thick and yields one ounce of gold per ton, at a total cost of mining and milling of less than 20s. per ton. These two last veins are the top or upper veins of the basin; as they lie very flat and level, and can be very cheaply worked, they promise to be important gold producers in the future. As the veins are more or less flat, the purchasers or owners of mines should ascertain the extent of vein in the claims from the outcrop or the point at which it enters until it leaves the claim by the side lines. This is a very important factor in determining the value of the mines in this district, and has heretofore been overlooked by purchasers. As yet nothing has been developed to indicate the depth to which the gold will be found in paying quantities. The present developed pay on the Main Reef has been proved by actual work to be at least 30 miles long, with a very uniform yield of gold and ore. It hardly seems possible that it will not be found to extend down to a great depth. All indications so far developed are that it will.

Gold.

GOLDEN vessels and jewellery have been found in the oldest Egyptian tombs, and have been brought to light in the excavations in Etruria. As early as the time of Pliny, mercury was used to form an amalgam with gold; and the art of gold-beating is of still greater antiquity, being referred to by Homer. This art probably originated among Oriental communities, where the use of gold ornaments has always been a distinguishing characteristic; in India, gold-beating is a craft involving much mystery and difficulty. Gold-leaf has been found in the coffins of some Theban mummies, in so thin a state as to resemble modern gilding. In modern times, one grain of gold has been beaten out to the extent of 75 square inches.

Gold is the only metal of yellow colour, and it possesses the rare power of resisting oxidation. When pure, gold is the most malleable of the metals. When very thin, gold appears yellow by reflected, and green by transmitted light. Gold is also extremely ductile—a single grain may be drawn into a wire 500 feet in length. The metal is not easily dissolved; finely-divided gold dissolves when heated with strong sulphuric acid and a little nitric acid.

Gold is found, in nature, chiefly in the metallic state, as native gold, or in combination with tellurium, lead, and silver. A native gold amalgam is sometimes found in California; and, in South America, gold is frequently found in combination with bismuth. The distribution of gold is world-wide. In America, the chief gold-bearing locality is in the west, along the Pacific slope, and embracing the whole distance from Alaska to Mexico, the largest deposit being in the valley of the Sacramento river. In Colorado and Nevada, gold is found closely associated with silver. The chief gold districts on the Atlantic side of North America, are on the Chaudière river, near Quebec, and in Novia Scotia; and, in the South, gold is found in Tennessee and North Carolina. Much gold is found in South America, Africa, and Australia, and some in Asia.

It is not generally known that the United States produces the most gold; then comes Russia, and then certain states of Australia. Much of the produce of Russia is derived from its Asiatic territories.

The most important alloys of gold are those with silver and copper. The natural alloy of silver and gold is called electrum. Among the Greeks rough nuggets of electrum were stamped and used as coins. Gold forms alloys also with zinc, tin, iron, platinum, and other metals.

The use of gold and silver, woven into patterns, in the sumptuous textiles of Oriental nations, is of old standing. Such garments are mentioned in Exodus, in the description of the ephod made for Aaron; and, later, in Homer's great epics. It is generally supposed that the art of embroidering and weaving with gold and silver thread originated in India, where it is still principally prosecuted, and whence the art was carried to other Eastern cities. Lately there has been much elegant and expensive trimming of this kind imported from Persia, to supply the demand which the return to the fashions of the Directory, in France, has occasioned. It is said that the wife of the emperor Claudius had a robe woven entirely of gold thread. Gold lace is woven on a warp of thick yellow silk. The gold wire used for this and similar purposes is always silver-gilt wire, and the proportion of gold is exceedingly small.

Our Anglo-Saxon ancestors were also lovers of the cloth of gold. Tennyson describes Enid, preparing for her wedding, arraying herself in a dress, "all branched and flowered with gold—a costly gift of her good mother:"

> "As the white and glittering star of morn
> Parts from a bank of snow, and by and by
> Slips into golden cloud, the maiden rose,
> And left her maiden couch, and robed herself,
> Helped by the mother's careful hand and eye,
> Without a mirror, in the gorgeous gown;
> Who, after, turned her daughter round and said,
> She never yet had seen her half so fair."

The Wedding Ring.

By John K. Allen.

THERE is no doubt that the ancient and honourable guild of jewellers, goldsmiths, and silversmiths has played a most important part in developing and fostering the finest sentiment to which the human heart is capable of responding—love—than have any other branch of artists. To these workers in precious metals have lovers repaired since Time himself was young, upon reaching that blessed and ecstatic period in life when they felt that further existence would be miserable without association with the objects of their affection. From the followers of this ancient art have such swains always received the emblems which join their hopes with those of gentle maidens, and to these emblems has there been paid a respect never accorded to any other article of personal adornment.

In all races which have been classed as civilised, the ring has played an important part in connection with the institution of matrimony. Its history grows dim and untraceable as search is made backward into early ages, but evidence of its existence meets archæologists with almost every turn of the spade in their investigation of ancient cities.

The very custom of wearing rings is so ancient that it is fabulous. The use of the ring as a token of friendship and fidelity is as old as the traditions of Genesis, but of its use in connection with betrothal and marriage there is no Biblical comment. There is, however, a remarkable monkish legend which relates that Joseph and Mary used a marriage ring of onyx or amethyst. The legend goes into circumstantial detail, claiming the ring to have been discovered in 996, being given by a jeweller of Jerusalem to a lapidary in Clusium, who was in Rome making purchases for an Etrurian marquis' wife. To the lapidary the Jewish jeweller related the precious character of the relic, but not appreciating its value as would a modern antiquarian under like circumstances, it was not prized by the lapidary nor cared for as a ring so rich in historical recollections deserved. His appreciation was finally aroused when a miracle revealed the genuineness of the connection of the ring with Joseph and Mary, and it was deposited in a church at Clusium, where it wrought cures which caused much wonder. In 1473 it was deposited with some

Franciscan monks at Clusium, from whom it was stolen, and since which time it has been wandering about among the churches of the Continent, many of them possessing it at the same time, a fact which leads some incredulous people to doubt the authenticity of the legend.

We do not need the evidence of the Bible to tell us of the use of the ring as a betrothal or marriage token. It is claimed by some writers that they were not used by the Jews until the custom was prevalent with other people, but examples of early Jewish rings now extant show them to have been of large size, with elaborate workmanship. An expression of kind sentiment was usually inscribed on them. One Jewish wedding ring of the 16th century is described by Wood in his interesting and curious book on "The Wedding Day in all Ages and Countries," as being of gold, richly enamelled, and decorated with beautifully wrought filigree. Attached by a hinge to the collet, in the place of the setting, was a little ridged capsule like the gabled roof of a house, which probably once contained a charm or perfume which may have delighted the sense of some dark-eyed Jewish beauty.

In the time of Pliny an iron ring set with adamant was given to the sweetheart as a pledge, the hardness of the materials employed being representative of the perpetuity of the engagement. Tertullian chronicles the use of gold betrothal rings, while Juvenal states that it was customary for a man to place a ring upon the woman's finger as a pledge of fidelity. Gold and the more precious metals have not always been employed in the manufacture of nuptial rings, some having been made of brass and copper. They were also decorated with emblematic devices, such as a key to denote the domestic authority conceded to the wife.

The circle being from the time of earliest association of ideas the type of eternity, its form in a wedding ring very naturally became an emblem of continuous love. The ring being highly prized by its recipient, and seldom separated from its proper finger, its inside surface very naturally became the bearer of some tender sentiment, the very nature of which prevented its more open publication.

The natives of Malabar had a custom early in the present century, which, for peculiar use of the ring in the marriage ceremony, is very marked. The bride and groom being seated on a throne, the woman's neck and head were decorated with jewels and flowers. The groom's feet were washed with milk by a young relative, who also put a silver ring upon his toe. The groom, as if to return the compliment, and go the young relation one better, decorates the attendant's finger with a gold ring, after which the ceremonies proceed.

The Italians, always lovers of artistic ornamentation, used betrothal rings of silver inlaid with niello. The bezel was oval or circular, the shoulders of the hoop so formed as to represent sleeves, from each issued a right hand, the hands being clasped. In Venice the giving of the betrothal ring was a public event.

The transition of the custom of using a ring at marriages from barbarism and paganism into the Christian church was quite as easy as the adoption of the forms of pagan worship. It was probably taken from the pagans of Italy as a part of the marriage ceremony. When the public betrothal finally became nearly obsolete, its evidence became the engagement ring, now used universally, while the use of a ring at weddings is now peculiar to certain church organisations.

The position of the ring on the hand has long been a matter of difference. In early times, by classical ancients, the betrothal ring was placed on the left hand, and on the finger next the least, under the impression that that particular finger was more closely connected with the heart than the others. In early English marriages the "Salisbury Manual" provided that the bridegroom was to receive the ring from the priest with the three principal fingers of his right hand; then, holding the right hand of the bride with his own left hand he was to say, "with this ring I thee wed." He then placed the ring on her right thumb and said, "In the name of the Father;" then on the second finger, and said, "the Son," then on the third finger, and said "and Holy Ghost," and finally on the fourth finger, and said "Amen," where it remained. Wearing the wedding ring on the thumb was not uncommon during the reign of the of the first and second Georges, in which position it is seen in contemporary portraits.

In the English Church the use of a ring at a wedding is essential, it being required by the rubric. The kind, size, or quality of the ring is not stipulated, and there are on record marriages in England in which bed-curtain rings, church keys, and even a ring cut transversely from a finger of a kid glove have been used. So far as our investigation has entered into these curious facts we do not remember to have seen any case in which the ring of a church bell was used.

In no other article of personal decoration does the art of the jeweller enter more deeply. In earlier days, when people were more easily impressed by forms, and when betrothals and weddings were more elaborately solemnised than they are now, the articles used in such forms and ceremonies naturally received much more attention and care in their manufacture. The Anglo-Saxons and also the French used for betrothals the gemel or gimmal ring, a jewel of double parts, having interlaced links turning upon a pivot or hinge, the links being capable of being shut up into one solid ring. The devices used in these were quite complex, some of them having as many as nine loops.

The early English poets frequently refer to the gimmal ring, one quotation being from Dryden's "Don Sebastian," written in 1690:

> "A curious artist wrought them,
> With joynts so close as not to be perceived;
> Yet are they both each other's counterpart.
> Her part had Juan inscribed, and his had Zayda
> (You know these names were theirs), and, in the midst,
> A heart, divided in two halves, was placed.
> Now, if the rivets of those rings, inclosed,
> Fit not each other, I have forged this tye;
> But if they join, you must forever part."

It would be an unnecessary task, and the result would be a dry contribution to archæological literature, should a description be given of the many wedding and betrothal rings which have been ploughed up in England, revealing, after a buried existence of centuries, the consummate art of the hands that fashioned them. Our museums are well supplied with samples of the ring-makers' art, all neatly arranged in chronological order and numbered in accordance with catalogues which give full information. To the curious jeweller reference is made to these depositories of antique art, while we give some curious facts showing how wedding rings are used in various countries.

Among the modern Greek peasants the wedding ceremony is one of much form and little solemnity, there being much which is allegorical in the performance. Two rings, a gold and a silver one, are interchanged between the contracting parties, the ceremony being concluded by both drinking wine from one cup. In the regular ritual of the Greek church, which is the prevailing worship in Russia, the betrothal ceremony was separate from the marriage and was conducted by the priest, who, after blessing a gold and a silver ring, gave the gold ring to the groom and the silver ring to the bride and repeated the form of the espousal, the rings being placed on the right hands of the parties. The groomsman then changed the rings in order that the bride would not feel the inferiority implied by the less costly material from which the silver ring was made, as well as to indicate the common ownership of property.

In Armenia the mother performs the pleasant duty of selecting a husband for her daughter, and as she probably selected some young fellow for whom she had a fancy, there was undoubtedly saved much of the acrimonious discussion which usually occurs between a man and his mother-in-law. After the terms of marriage were agreed upon, the bridegroom's mother, accompanied by a priest and two matrons, visited the bride and gave her a ring as a token of espousal. They were afterwards married with a ring.

In Java, where marriage occurs at a very tender age, the courtship is carried on by the parents, the children not being allowed to interfere, and a ring is given the girl as an evidence that the engagement is binding. In Iceland a large ring, variously formed of bone, stone, jet, gold, and silver, was used as a ratification of engagements. It was large enough to permit the groom to pass his four fingers and palm through it, in which hand he received the bride's hand during the betrothal. Occasionally these ceremonial rings were placed upon the altar and there used. This may be a modification of an old custom prevalent in the Orkneys, where the contracting parties joined hands through a perforation or ring in a stone pillar.

In Ireland many of the peasantry believe that marriage without the use of a gold ring is illegal, and at one town, at least, a person kept wedding rings for hire. In Claddagh, at Galway, nuptial rings of very ancient patterns are found among the fishermen's wives, they having descended through many generations as heirlooms.

In America the custom of giving rings to indicate the betrothal, and their use at weddings, is general, few churches rejecting this silent emblem of a compact which should be endless. It is a strange thing that a custom once established should follow down century after century, and become as wide-spread as mankind itself. The use of an engagement ring gives plenty of opportunity to the jeweller for judicious suggestion, and prospective bridegrooms should be urged in purchasing any jewel, to insist upon its flawless purity. A diamond is believed to be the favourite gem, but as its size with the vulgar is supposed to bear some proportion to the fortune of the giver, ladies of delicacy prefer smaller settings.

Assorting Jewels to Complexions.

A WOMAN who has a red face will not wear emeralds, according to a contemporary, even if an arbitrary man milliner sends her home a dress that emeralds would embellish. Pity she cannot dress herself without such aid, for, alas! the face is not generally considered in the concoction of eminent milliners, and I have observed cases where their views have been independent of the figure. A woman with a poor complexion does not improve it by pearls. These lovely and innocuous ornaments really derive their chief lustre from a transparent skin, as they depend largely on reflected lights. The iridescent colors on pearls attract notice to the whiteness of a white ground, but on an ill-coloured ground they are decidedly vindictive. A woman whose face, however beautiful, takes various tints in the shadows, should avoid rubies, especially pink ones, and roseate topazes. A face may have these greenish tints without damage to beauty, remember. I am not selecting all the most unfortunate women I can think of to threaten and warn. Every face has a great deal of green in it, as a portrait painter will tell you. Giotto (who painted the loveliest angels conceivable) and all his pupils made the shadows on girls' faces startlingly green, and the eyes green, too, sometimes, and yet we receive the impression of exquisite delicacy and brilliancy. Still, red is the complementary of green, and if the dress should be pink, and no help for it, the jewels nearer the face ought to counteract it. A wise man will not select the precious opal for his fiancee's ring, especially if the engagement is to be a long one, nor as christening gift to a robust child. Opals are unlucky, they say, probably because they are extremely brittle. An acquaintaince of mine, a great collector of precious stones, lost a fine opal under particularly annoying circumstances. He was pricing a fine specimen at a well-known jeweller's. He and the shopman were passing it from hand to hand. It fell and was pulverised on the glass counter. Each accused the other, and eventually the gentleman had to pay, and the jeweller lost more than the value of the stone in a valuable customer. Science tells us that the opal is a resinous quartz which owes all its beauty to its imperfections. The milky ground, transfused with sunset fires, derives its celestial colours from fissures interrupting the continuity of the substances. Is it therefore wonderful that I do not recommend the opal for hard wear? Art tells us to avoid the opal as we avoid the pearl, unless we can do it justice by a lovely background. There is no stone so revengeful when ill-treated. Try a fine opal on a coarse red hand or freckled neck and judge. On similar grounds do not try to reconcile a good sapphire with a sallow cheek. The spiteful thing will loudly announce your misfortune. But the gentle turquoise (always supposing you get a real one—they say the Orientals have not sold us a genuine turquoise for ten years) is more amiable. There is no stone that so sets off a fair white hand, and if its owner fall sick, or be troubled mentally, the turquoise will temper its vivid blue to a sympathetic green. I really think there is some ground for this old Turkish superstition, which no doubt means that the stone is sensitive to mephitic or acid vapours.

Workshop Memoranda.

To restore the polish on opals scratched by wear, rub with oxide of tin or putty-powder on a piece of chamois-skin, wet; then wash the opal with a soft brush and water. With care, this may be done without taking it from the setting.

Cement.—A very good cement for ferrules and for chucking light articles in the lathe is made as follows: In an iron ladle melt some best yellow resin, and stir into it some good plaster of Paris; when about the consistency of treacle, pour out on cold slab; when cold it should break with a sharp metallic snap; if too soft put in more plaster; if too hard more resin. Apply to ferrule by softening in gas flame; set your pinion or wheel true whilst warm, and when job is done melt off with oil in a small metal cup or ladle, held over gas, and made to boil; rinse in benzoline, and it is as clean as when you started.

To Sharpen a Graver.—Do not sharpen the face of a graver in the middle of the stone. The face of a graver must be sharpened the oftenest, and in doing that the stone receives the greatest wear. The face of a graver should be sharpened near the edge (not the end) of the stone, as near the top edge as possible, for if the *lower* end be used, and the tool during the operation slip off from the stone, its point is almost sure to be rasped away, and the cutting edge of its belly seriously damaged by the accident. Use the *top* edge, and avoid the danger. By following this advice, the largest portion of the face of the stone is kept in good order for sharpening graver bellies.

Report of the Commissioners for the Exhibition of 1851.

THE Commissioners have just issued their seventh report, which brings the account of their proceedings down to the present time. The number of institutions now standing on the estate of the Commissioners is as follows:—

1. The South Kensington Museum, the Schools of Science, and the Department of Science and Art.
2. The Natural History Museum.
3. The India Museum.
4. The Patent Museum.
5. The Museum of Scientific Instruments.
6. The Royal Albert Hall.
7. The Central Technical Institution.
8. The Royal College of Music.
9. The Imperial Institute.
10. The Royal School of Art-Needlework.
11. The Alexandra Home for Female Students.
12. The Museum of Fish Culture.
13. The Anthropological Laboratory.
14. The School of Art Wood-carving.
15. The Home Arts and Industries Association.
16. The School of Cookery *(now removing)*.

The Commissioners give the following account of the amount of their contributions to public purposes.

"In our last report we mentioned that the result of the Exhibition of 1851 left us in possession of a sum of £186,000, and we showed that the continual increase in the value of our estate had already enabled us to contribute to public purposes money and property amounting to nearly half-a-million. We have since the date of that report allotted, as above reported, for the Central Technical Institution a site valued at £40,000; to the Alexandra Homes a site valued at £10,000; to the Royal College of Music a site valued at £45,000; and to the Imperial Institute a site the value of which cannot be estimated at less than £250,000. In addition to these grants of land, we have by our annual subscription of £500 a year to the Royal College of Music, provided a sum of £3,000 for musical education."

The conclusions of the report are thus summarised:—

"We have mentioned the non-acceptance by Her Majesty's Government of our offer to provide a building for a Museum of Science, and the steps which we have subsequently taken in the hope of inducing the Government to establish on our estate those institutions ancillary to the teaching of science which are necessary to form a complete system of scientific education for this metropolis. We have referred to the circumstances which compelled us to put an end to the connection between the Royal Horticultural Society and our estate, and have narrated the steps taken to recover possession of the gardens from the society, and the uses to which that portion of the estate has been subsequently put. We have given detailed accounts of the establishment on our estate, since our last report, of the Central Technical Institution, the Royal College of Music, the Alexandra Homes, and the Imperial Institute, and have also explained the relations which have existed between us and the various bodies accommodated on our estate. We have reported the various other dealings with the estate since the date of our last report, and have submitted statements showing our financial position. We have also submitted our proposals for the future, which are in effect the raising of a considerable free income by allotting for private building purposes part of the northern portion of the central quadrangle of our estate, while reserving in our hands sufficient space for the development of the Science and Art Department, and the foundation, from part of the surplus income thus obtained, of scholarships for the purpose of assisting provincial technical institutions of science and art, and connecting them, if they desire it, with the larger schools and colleges which exist in the metropolis.

"The experience of recent years has convinced us that a substantial disposable income will enable us to work more usefully in this and other directions for the public benefit than would the mere ownership of unproductive land. While we have always kept in view the original objects of our trust, the remarkable increase in the value of the estate which was secured to us by the wise forethought of His Royal Highness the Prince Consort, our first president, has enabled us to give a wider scope to our work than could have been anticipated from the amount of the fund which the success of the Exhibition of 1851 placed in our hands. The profits of that Exhibition were derived from national and not simply metropolitan co-operation, and we believe that we carry out the wishes of its royal founder when we propose to realise part of our property for national purposes."

Society of Arts Examination.—The subjects of the Society of Arts examinations for the year 1890 are—1, Arithmetic; 2, English (including composition and correspondence, and précis writing); 3, Book-keeping; 4, Commercial Geography; 5, Shorthand; 6, French; 7, German; 8, Italian; 9, Spanish; 10, Portuguese; 11, Russian; 12, Danish; 13, Chinese; 14, Japanese; 15, Political Economy; 16, Domestic Economy; 17, Theory of Music; 18, Practice of Music; 19, Practical Commercial Knowledge. These examinations will be held on April 14, 15, 16, and 17, with the exception of that in the Practice of Music, which will be held during the week commencing on June 2. The programme is now ready, and copies can be obtained gratis on application to the secretary, John Street, Adelphi, W.C.

Defective Sight and its Optical Correction.*

By W. D. Mason, A.P.S.

(Continued from page 71).

ASTIGMATISM.

ASTIGMATISM is a defect of vision dependent upon a want of symmetry or faulty shape of the cornea.

The cornea, or front portion of the globe of the eye which is seen to project when viewed in profile, ought to be nearly spherical, curving equally in all directions like the smaller part of a marble which has been cut into two unequal portions. But in some eyes the curves are sharper in one direction than another, just as the bowl of a spoon curves more sharply across than lengthways.

The consequence is that the eye when at rest has no proper focus and is said to be astigmatic, which means without a point or centre.

Supposing the meridian of greatest curvature to be vertical, and that of the least curvature horizontal, the eye would be more short-sighted for horizontal than for vertical lines and boundaries. If the rays refracted by the meridian of least curvature were brought to a focus exactly on the retina, those refracted by the meridian of greatest curvature would be brought to a focus before reaching the retina, and all vertical lines and boundaries would appear perfectly clear, while horizontal ones would seem hazy and indistinct.

In looking at a clock, about twenty feet away, with the accommodation at rest, the figures would vary in distinctness according to the angle at which they were seen. The twelve and the six would seem blacker and clearer than the rest. The nine and the three would be dim and hazy, or perhaps altogether invisible. The intermediate figures would be seen more clearly as they approached the vertical, and less clearly as they approached the horizontal. By turning the clock face round or holding the head sideways all this could be reversed.

The eye would be short-sighted for horizontal lines, but for vertical ones vision would be perfect.

An ordinary concave spherical lens, curving equally in all directions, which was of sufficient power to correct the myopia for horizontal lines, would spoil the sight for vertical lines, which was already perfect, and render it artificially hypermetropic in that direction.

But a plano-concave cylindrical lens of proper focus, that is, a lens perfectly flat on one side, and forming a portion of a hollow cylinder, instead of a hollow sphere, on the other, and with the axis of the cylinder held horizontally before the eye, would correct the defect.

The rays proceeding from vertical lines would pass without change through a piece of glass with parallel sides, but the rays from horizontal lines would be refracted by the concavity of the lens, and brought to a later focus exactly on the retina.

In like manner if the eye were hypermetropic for one set of lines and emmetropic for another, a convex cylindrical lens of the proper focus, like a piece cut off the side of a ruler, instead of a portion of a solid sphere, and placed with its axis in a proper direction, would restore perfect vision all round.

These would be described as cases of simple myopic and simple hypermetropic astigmatism.

In compound astigmatism the ametropia in the two principal meridians is like in kind but different in degree. The eye would, in compound myopic astigmatism, be short-sighted for both sets of lines, but more so for one than the other. In compound hypermetropic astigmatism there would be long-sight or hypermetropia for both sets of lines, but more for one than the other.

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Mixed astigmatism would render the eye myopic for one set of lines, and hypermetropic for the other.

The compound and mixed forms of astigmatism are corrected by using cylindrical lenses of such power and placed with their axes in such directions as to make the eyes myopic or hypermetropic all round alike, and then the plane surfaces of the lenses are ground spherically to the focus required for correction of the myopia or hypermetropia in the ordinary way.

Whenever practicable, atropine should be used in testing for astigmatism, as, like hypermetropia, it may be partially or wholly concealed by involuntary efforts of accommodation.

In such cases the symptoms commonly complained of are weariness and aching of the eyes with more or less defective vision, and ordinary spherical glasses afford little or no relief.

Of course it is not to be supposed that the two principal meridians are always vertical and horizontal as in the examples stated. They may be in any direction and are more frequently oblique, but will almost always be at right angles to each other.

Astigmatism, as a rule, exists from birth, but is sometimes the result of cuts and wounds of the cornea, which in healing have caused unequal contraction.

Such are the structural defects of vision depending on a faulty shape or want of symmetry in the eye-ball.

The emmetropic or theoretically perfect eye is seldom met with, but a slight degree of hypermetropia and astigmatism, not sufficient to be disturbing to vision and not calling for optical interference, is the rule, rather than the exception.

PRESBYOPIA.

Presbyopia, or old sight, sometimes improperly called long sight, is the condition of vision in which distant objects are seen as clearly as ever, but owing to a stiffness and hardening of the crystalline lens brought on by age, constitutional peculiarity or over-work, there is a loss of the power of accommodation and near objects appear misty and indistinct, especially in a dim light or by artificial light.

Presbyopia is common to all eyes as a necessary accompaniment of advancing years, and may be considered to have fairly set in when the ordinary or normal eye cannot distinguish small print clearly at a distance of eight or nine inches.

A person who could see to read small print at ten inches, but no nearer, would probably only be able to read at twenty inches for any length of time, for the rule is that only half the total amount of accommodation is available for continued effort.

This would place the ordinary reading near point at twenty inches, and, in a good light, such a person might manage very well for a time. But by artificial light or at dusk the printed page would require to be held nearer, and this can only be done by the intervention of a convex glass to do part of the work previously done by the crystalline lens. Such a convex lens of suitable power would just converge the rays of light sufficiently to enable the eye to accomplish the rest and bring them to a proper focus with ease and comfort.

It is a common error to suppose that there is great danger of presbyopic persons damaging their sight and even blinding themselves by using spectacles that are too strong. There is much more danger of injuring the sight by attempting to read or work without glasses when they are required, or using too low a power and so straining the eyes for want of the requisite assistance.

The focus of the lenses used should be nicely adjusted to the requirements of the wearer, and should give complete and not merely partial relief. The proper reading distance is fourteen to sixteen inches. Lenses which require the type to be held at a greater distance are too weak, and those by which the reader is compelled to hold it nearer—say nine or ten inches—are too strong.

If barely strong enough for present use, as the eyes grow older the presbyopia will soon outstrip the power of the glasses, and they will have to be changed for stronger at short intervals.

The effect of spectacles which are too strong is to create a strain on the convergence muscles which are unduly exercised while the accommodation is rested, which strain soon becomes intolerable.

But if lenses of the proper focus, strong enough for complete relief, but not so strong as to disturb the harmony between the accommodation and convergence functions to any appreciable degree, be used from the first, they will often last for several years without change.

When the old uncomfortable sensations begin to be felt during the use of the glasses by artificial light, a new pair should at once be selected on the same principles, but the old ones may still be used for a time by daylight with advantage.

Many persons wish for glasses which will enable them to read small type or discern other minute objects at a distance of three or four feet, but this is an impossibility. The utmost that can be expected of spectacles, under the most favourable conditions, is that they will restore normal vision, but they will never impart a telescopic or microscopic character to a person's sight.

In some cases of very aged or greatly impaired sight, lenses of such strength, that the reading distance is reduced to six or seven inches, must be used, or the patient cannot read at all. But such eyes cannot be used for long together.

It is always safe to use a single lens for one eye, as strong as ever is needed, and to hold the book or work at the short distance required for distinct vision. In this monocular vision the muscles of convergence are not used. But it is better, even then, to use the eyes alternately, or one eye may eventually differ greatly in focus from the other.

The foregoing remarks apply to the presbyopia of ordinary eyes which may be fairly considered normal.

But presbyopia is common to all eyes, and will modify the range of vision of those suffering from any other defect.

Myopic subjects will require either a weaker convex lens than usual for reading, no lens at all, or a weaker concave lens than they formerly used, according to the degree of their myopia.

In the same manner the hypermetropic, while still requiring their old glasses for distance, must have stronger ones for reading, and these lenses will have to be much more convex than those used by emmetropic persons of the same age.

Whatever the kind of eye, the far point, under ordinary circumstances, will remain the same, but the near point will recede further and further away as age advances, until ultimately, if the person live long enough and the eyes remain healthy, the far point and the near point will coincide, there will be no power of accommodation left, and the refraction of the eye having been ascertained, it can be at once predicted what lenses will suit for any certain specified distance.

Old sight generally begins to make itself known in ordinary eyes at the age of 40 to 45, and sometimes much earlier.

It should be recognised in good time, and optical assistance should at once be sought when the letters of small print appear to run together, when the book or work has to be held at a greater distance than formerly, or when the sight begins to fail by artificial light.

Many people foolishly object to wear spectacles because, they say, they do not wish to look old, and if their eyes once become accustomed to glasses they will never be able to do without again.

The first of these objections is not worthy of any serious consideration, and, as a matter of fact, spectacles do not make a person look either older or younger. Now that the subject is so much better understood than it was a few years ago, we see increasing numbers of children and young people wearing glasses.

The second objection is well founded. If you commence to wear glasses for old sight you will have to continue their use, for you will grow older and not younger; but it is much better to take to spectacles a few months or even years earlier, than to tax and strain the eyes, and probably permanently injure the sight by trying to do without them.

(To be continued.)

Mechanical Ocular Defects.

THE framing of lenses is, says Dr. Bucklin in the New York *Jewelers' Circular*, an intensely practical subject and should be thoroughly understood. The truth of the matter is, the subject is the least thoroughly understood of any in the whole chapter of practical optics as applied to the selection of correction lenses. I frequently meet practical men who have been in the retail optical trade for twenty or more years who gaze with astonishment upon some experiment which demonstrates the absolute necessity of careful framing. They freely acknowledge that they never had suspected that so many difficulties could be caused by the faulty relative position of the lenses produced by an improper frame. Simple spherical lenses are, owing to this fact, much more difficult to handle correctly than cylindrical lenses.

The majority of applications I receive from students commence by stating that they know all about spherical lenses and their adjustment for the various ocular defects requiring their use, but they now wish to learn the nature of some of the complicated subjects, such as astigmatism and its correction by cylindrical lenses, etc. Astigmatism and its correction is a simple subject, while the use of spherical lenses for the correction of *hyperopia*, *myopia*, and *presbyopia* presents unending complications which the most experienced experts have great difficulty in overcoming. Nothing convinces me more thoroughly that an individual knows absolutely nothing about optics as applied to the eye than his statement that he knows all about the subject excepting *astigmatism* and the *muscles*. The mere fact that he does not understand the ocular muscles demonstrates that he does not understand the use of spherical lenses as he should, for in the muscles lie all the difficulties which complicate the use of spherical lenses.

There are few men with so bright a mind that they can learn how to use simple spherical lenses properly without having had thorough instruction on the subject.

Every pair of lenses of considerable strength which are exactly suited to the eyes of an individual, may be so framed that the party cannot wear them without experiencing immediate discomfort.

The requirements of distinct binocular are very complicated. It is necessary that the ciliary muscle of each eye and the twelve muscles which direct the visual lines of the eyes in binocular fixation shall act in such perfect harmony that both eyes are easily directed at any given object, and easily accommodated for this object without bringing any undue strain on any muscle involved in this complicated action. The relations existing between accommodation and convergence being very exact, they are consequently easily disturbed. The individual with a given degree of convergence has learned to use a given amount of accommodation; the introduction of lenses disturbs these existing relations. When the lenses are properly introduced, the disturbance arising from this cause will be less than the disturbance of accommodation which existed without the lenses. In many cases the introduction of the lenses in an improper manner produces a greater muscular disturbance than the accommodative disturbance that formerly existed without the lenses, although the lenses have been properly selected.

Convex lenses act from the centre as prisms, the base being at the centre of the lens. Concave lenses act as prisms, the base being at the circumference of the lens. These lenses cease to act as prisms when the line of vision passes exactly through the centre of the lens. It will thus be seen that they may be deprived of the prismatic effect they produce by placing the centres so that the line of vision for each eye passes directly through the centre of the lens when they are used. The lenses may be placed so that the prismatic effects assist given muscles, or they may be so placed that they increase the work necessary for given muscles which were already taxed to their utmost capacity. This is the cause of the trouble experienced by most persons who first attempt to wear convex lenses, the relations between the fixation of both eyes and the accommodation being disturbed in any case, and being disturbed to a very annoying degree when the centres of the lenses are outside of the line of vision. They then act as prisms, antagonising the internal muscles in their efforts to produce convergence. When the centre of one lens stands higher than that of the other the most annoying weak vision is produced when the vertical muscles are normally balanced. Occasionally individuals having a weak vertical muscle wear their glasses with a most decided tilt, thus favouring with the vertical prismatic effect of both lenses the disabled muscle.

Convex lenses for reading require the distance between their centres to be much less than the distance between the pupils of the eyes. The proper position for lenses in the frame can only be determined by experimental trials on each individual. The American adjustable trial frame is most valuable for this purpose.

Many persons cannot use the same frames for distant vision and reading, owing to a peculiarity of the nose and face. Frames which are perfect for reading set too low for distant vision, and *vice versâ*. A selection of sample frames from the various manufacturers should be in the possession of those who deal in optical goods, for there is no way so perfect in determining what kind of a frame to order as an experimental trial with the frame. The catalogue number of the manufacturer being attached to the sample, you simply have to give the number, pupil distance, height of nose, and you will obtain the frame desired. Occasionally it is necessary to please an individual by ordering cylindrical lenses in eye-glass frames. Instruct the individual to take hold of each end of the frame selected, and place it where he finds it most comfortable. Then carefully measure with delicate dividers the distance between the spring parts and lay this distance on a match. *Carefully* cut the match, being sure that both marks from the dividers are cut away. Enclose this frame with the piece of match to the manufacturer, indicating the points on the frame between which the match must be placed.

Your prescription will then be filled with approximate correctness. When the glasses are returned let the patient place them on his nose. Cover one eye with a card and slightly tilt the frame up and down to determine if the axis is in the best possible position. Repeat this experiment on the other eye. Any slight error in the position of the axis may be corrected by adjusting the frame. To finally test the correctness of both axes, call the patient's attention to a card at twelve feet distance; if it appears perfectly square the axes are correct; if not, the axis of one or both cylinders is wrong or the cylinders are too strong. Distant square objects should not appear out of square.

All cylindrical lenses ordered should be tested when they are returned from the manufacturer in the above manner. The correctness of the axes of cylinders should always be tested with a square card before they are ordered.

A frequent trouble which is unrecognised and makes selected lenses unsatisfactory, is their being out of centre. It is not an unfrequent thing to find the optical centre of a lens a quarter-of-an-inch away from the centre of the lens. This defect can be detected by looking squarely through the centre of the lens at two lines which cross each other at right angles. When the lens is centred the portions of the lines seen through and outside of the lens are all continuous. When the lens is not centred the amount and direction it must be moved to make the lines continuous, locates the position of the optical centre of the lens.

Note.—The student with the above text before him and a small collection of assorted lenses to practise with, will become very expert in a short space of time in analysing lenses, and will also become very familiar with the cylindrical and prismatic effects which can be produced by changing the position of various spherical lenses.

All the lenses and combinations of lenses which we have thus far considered exist in human eyes. The defect is of an opposite value from the lens required to correct it.

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Applications for Letters Patent.

The following List of Patents has been compiled especially for *The Watchmaker, Jeweller and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; and 6, Lord Street, Liverpool.

13,065. F. D. Dencker, London, for "Improvements in chronometers." Dated August 19, 1889.

13,270. S. Goode, London, for "Improved means for applying bows to the pendants of watches." Dated August 22, 1889.

13,290. J. W. Houghton, London, for "Improved attachment for alarm clocks." Dated August 23, 1889.

13,311. W. J. Nunn and C. W. Smith, Durham, for "The improvement for air-expelling lining for moulds in which gold, silver, brass, copper, bronze, steel, &c., are cast." Dated August 23, 1889.

13,325. W. C. Edwards and A. G. Sparkes, London, for "Locomotion produced by clockwork, applicable to tricycles, velocipedes, &c." Dated August 23, 1889.

13,348. W. T. Chafer, Doncaster, for "An improved brooch pin or tongue." Dated August 24, 1889.

13,397. H. E. Kleiner, London, for "An improved stud for shirt fronts, cuffs, and analogous articles." Dated August 24, 1889.

13,432. T. K. Rose, London, for "Improvements in filtering or separating gold from liquids containing the same 'in solution.'" Dated August 26, 1889.

13,698. M. A. Braconnier, 323, High Holborn, London, for "Improvements in or relating to lithographic, ornamental or other stones." Dated August 30, 1889.

13,730. S. B. Hull, London, for "An improved pocket watch-protector." Dated August 31, 1889.

13,793. W. T. Story, Halifax, for "An improved means to be employed for regulating the pendulum of English, French, or German clocks." (Complete Specification.)

14,065. H. G. Hickey, London, for "Improvements in watch-protectors." Dated September 6, 1889.

14,203. H. P. Truemann, London, for "Improvements in the construction of clockwork movements." Dated September 9, 1889.

14,277. R. Bresch, London, for "Improved watch stand." Dated September 10, 1889.

14,357. E. Dodé, London, for "Improvements in refining and separating precious metals." Dated September 11, 1889.

Recent American Patents.

Astigmatic Eye-piece for Optical Instruments. Joseph Kornblum, John A. Brashear, and Park Painter, Allegheny, Pa.	408,725
Button or Badge. Stephen C. Wilcox, Dubuque, Iowa... ...	409,132
Cane or Parasol Watch. James W. Allen, St. Louis, Mo. ...	409,267
Clasp for Necklaces. Adam Keller, New York	408,308
Clip for Silverware Cases. Henry Siebert and William Siebert, Bayonne, N. J.	408,935
Clock. Edward M. Moulton and Mark Moulton, Rochester, N. Y.	408,665
Clock Pendulum. Walter D. Davies, Brooklyn, N. Y.	408,955
Engraver's Tool. George A. Mason, Washington, D. C. ...	408,498
Eye-glass Holder. Simon R. Stibgen, Marietta, Pa.	408,268
Jewellery Tray. Lou Burt, Detroit, Mich.	408,576
Key Holder. Charles E. Van Norman, Waltham, Mass. ...	409,255
Musical Clock. John Sprangers, Kaukauna, Wis.	408,903
Stem Winding and Setting Watch. Edward K. Boyd, Chicago, Ill.	408,573
Timepiece Escapement. Alexander Kaiser. Berlin	409,150
Watch Case. Jules Dubois, Brooklyn, N. Y.	408,830
Design Patent No. 19,276—Handle for Table Ware. Robert Henry Klingel, Bridgeport, Conn.	
Design Patent No. 19,277 and 19,278—Fountain Pen or Pencil Holder. Edward Todd, Junr., New York.	
Design Patent No. 19,269 and 19,270—Clock Case. George Ward Bidwell, New Haven, Conn.	
Design Patent No. 19,271—Badge. Joseph K. Davison, Philadelphia, Pa.	

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller and Silversmith*, 7, St. Paul's Churchyard, E.C.

Gazette.

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THE BANKRUPTCY ACT, 1883.

RECEIVING ORDERS.

To surrender in London.—Lyus, Samuel, Brunswick Road, Camberwell, jeweller.

To surrender in the Country.—Smith, George Tuxford, Boston, watchmaker, Brendon, George Edward, Launceston, jeweller,

PUBLIC EXAMINATIONS.

In the Country.—J. L. Reymond, Norwich, licensed victualler and watchmaker, September 30, at 11. G. T. Smith, Boston, watchmaker.

In London.—W. J. Jennings, Tysoe Street, Clerkenwell, jeweller, October 16, at 11.30. J. Jameson and Mary Ann Jameson (trading as Caleb Jameson & Co.), Houndsditch, wholesale cutlers, October 17, at 11.

ADJUDICATIONS.

In the Country.—G. E. Brendon, Launceston, jeweller. G. T. Smith, Boston, watchmaker.

In London.—S. Lyus, Brunswick Road, Camberwell, jeweller.

NOTICE OF DIVIDEND.

In the Country—Mary Kaiser, Leamington, optician, 2s. 6½d., first and final, 17, Hertford Street, Coventry.

The Deeds of Arrangement Act, 1887.

HANTS.

Long, Edgar, 9, Great Southsea Street, Southsea, jeweller and watchmaker. Trustee, George Loveridge, 65, Hatton Garden, E.C., wholesale jeweller. Unsecured Liabilities, £235 6s. 1d. Estimated Net Assets, £160 4s. 1d. Deed of Composition dated August 27, 1889; filed September 3, 1889.

LANCASTER.

Gibson, Emma, 39, Norton Street, Liverpool, wholesale jeweller. Trustees, Allen Edwards, 14, Bennett's Hill, Birmingham, C.A., and another, with a Committee of Inspection. Unsecured Liabilities, £1,509 4s. 9d. Estimated Net Assets, £802 10s. Creditors fully secured, £17 10s. Deed of Composition dated September 7, 1889; filed September 11, 1889.

SURREY.

Burnett, Edward Thomas Alfred, 2, High Street, and formerly of 50, High Street, Croydon, jeweller, now out of business. Trustees, George H. Brook, 47, Holborn Viaduct, E.C., wholesale grocer, and another. Unsecured Liabilities, £734 7s. 6d. Estimated Net Assets, £618 4s. 8d. Deed of Composition dated August 27, 1889; filed August 31 1889.

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller and Silversmith, *7, St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller and Silversmith.*

18, Bentinck Street, Welbeck Street, London, W.,
Sept. 23rd, 1889.

Sir,—As the author of "Is bad sight on the Increase? The Philosophy of Sight," I would be pleased if you would allow this letter to appear in the coming issue of your valuable journal. I am writing for the purpose of urging those readers interested in spectacles and eye glasses, to refute to their customers the idea that they (the customers) have to seek glasses because of badness of, or defective or impaired vision. In reality, these people are seeking tools to UTILISE their vision. All the spectacles in the world could not give sight to one blind man, but it is doubtful that there will ever be sufficient spectacles made to bring out all the sight that might be used.

To stimulate a man's personal pride and contentment by pointing out that glasses of use to him are revealing how good his sight is, is logical, and better than making him feel despondent over them. Such policy should deal a death-blow to that vanity that makes so much opposition to glasses. It should be the means of inducing many to inquire about their sight that at present are literally afraid of doing so, for fear they might be told they required glasses. A paradox is a proposition contrary to received opinion, yet true in fact. Here is one: the more glasses used, the more sight used.

I am, Sir,
Yours obediently,
A. FOURNET.

The Watchmaker, Jeweller & Silversmith.

EDITED BY D. GLASGOW, JUN.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. THE WATCHMAKER, JEWELLER AND SILVERSMITH will be found an exceptional medium for advertising. Special Notices, Situations, &c., per insertion, 1s. for two lines, prepaid.

Address all business communications to the Publishers,

MESSRS. TRUSLOVE & SHIRLEY,
The Watchmaker, Jeweller & Silversmith,
7, ST. PAUL'S CHURCHYARD, LONDON.
Birmingham Branch: 22, HYLTON STREET.

Agents for New South Wales and Queensland:—
MESSRS. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

THE Merchandise Marks Act as it affects the watch trade, is once again on the tapis, and, if the fears and consequent allegations of all the speakers at the recent Prescot meeting are well grounded, it is not a whit too soon for the attention of those who are interested in its thorough working to be drawn to it.

The Prescot people have done good work in the past in helping to get the measure carried out; and it is not only to be expected, but fit, that they should be anxious to see that the Act does not become a dead letter.

But in meetings of the sort recorded on another page there are always to be found individuals who, in their doubtless well-meant enthusiasm, go a good deal further than was ever the intention of the conveners or the avowed objects of such assemblages, and it would seem as if the meeting under discussion was no exception to the rule. Anyhow, the Coventry trade have evidently been under the impression that some of the remarks made thereat, anent the putting of foreign-made movements into English cases, were pointed at them, and have, at a subsequent meeting held in the city of the spires, entered what amounts practically to a protest against the same.

It is, perhaps, too much to expect that such unbridled enthusiasts can ever be restrained, or that partisan expressions can ever be kept within bounds, and it is well known that the relations of the two places have been somewhat strained of late. Still, such innuendos as those referred to are much to be deprecated, and should be promptly stopped by those having the leadership of such meetings. It is in the nature of a truism to say that trade harmony promotes the true interests of the trade. Nevertheless, it should be quite apparent that the interests of Prescot and Coventry in keeping the foreigner out are identical; and for ourselves, it would require a good deal more than the random accusations of any injudicious person at a public meeting to prove that the interests of either can be promoted by encouraging such a suicidal policy as the infringement of the Merchandise Marks Act in the direction indicated.

GENERAL NOTES

Fire.—The premises of Mr. M. Spiridion, watchmaker and jeweller, Commercial Street, Cardiff, were damaged by fire last month to the extent of £10.

A large block of silver ore from a mine in which the Tasmanian Land and Exploration Company is interested is now on view at the offices, 8, Old Jewry, E.C.

Larceny.—One of the worst forms of robbery from employers has just received a check in Belfast, Messrs. William Gibson and Co., silversmiths, being the prosecutors, and the prisoners being former employees of the firm, in company with a message boy who turned evidence and peached on his confederates.

Death of a Cape Jeweller.—The death of Mr. Courtis, of the firm of Toll and Courtis, jewellers, Grave Street, Cape Town, is announced as having taken place in September last. The deceased had only just returned from Johannisberg, where he contracted the germs of the fever, from which he succumbed.

"John Round and Son, Limited."—The writer of the article on Messrs. John Round and Son, published in our last issue, wishes to point out an error which occurred in the first column of page 86. In the last paragraph but one, "Thus it comes about that the cost of the best," &c., should read, "Thus it comes about that the *difference between* the cost of the best," &c.

The Paris Exhibition Awards.—Although the name of no English firm appears in the list of the Grand Prix takers in Class 26, it is at least some satisfaction to see one London firm identified with this coveted distinction, and we are sure that in congratulating Messrs. Baume and Co. on the award to their Longines watches, we are only echoing the sentiments of many of our readers.

Practical Sympathy.—Last month, Messrs. Herrington, Nye, Church, and Walsh, waited upon Mr. Beha, jeweller, High Street, Sutton, whose shop was broken into a few weeks ago, when almost the whole of his stock was cleared out, and presented to him a sum of just over £20, which had been subscribed by his fellow tradesmen and neighbours, as an expression of their sympathy with him in his misfortune.

The Clockmakers' Company.—A court of this company was held on September 30, in accordance with the charter, for the election of officers for the year ensuing. The Master (Mr. Alderman Savory) occupied the chair. The following gentlemen were respectively elected to take office in January next, viz.: Master, Mr. Deputy Atkins; senior warden, Mr. D. Clarke; renter warden, the Rev. H. L. Nellthropp, M.A.; junior warden, Mr. S. Isaac.

New Book.—Messrs. Crosby Lockwood, and Son have just published a companion book to Mr. Hasluck's "Handybook for Watch Jobbers," by the same author. This is the "Clock Jobbers' Handybook," and in it are simply and clearly described all the processes necessary for the making of an efficient clock repairer. It should prove an invaluable assistant to the country workman; it is copiously illustrated, and its price (2s.) brings it within the reach of all.

Shop Robbery in Northumberland Avenue.—A daring burglary was found to have been committed on the premises of Mr. Henri, 5, Northumberland Avenue, on the 7th ult. The glass plate of the window was cut with a diamond, and the glass removed to an adjoining doorway. About £80 worth of optical instruments were abstracted. The robbery, it is stated by the police, must have been committed after 6 a.m., but Mr. Henri, the owner, is of opinion that it must have taken place overnight.

International Mining and Metallurgical Exhibition.—The movement for the promotion of an International Mining and Metallurgical Exhibition, to be held in London in the spring of next year, is, we are told, making important progress. The promoters have had a satisfactory interview with the authorities of the Crystal Palace on the subject, and they are now formulating a definite scheme, and a prospectus of the first International Exhibition of Mining and Metallurgy in London will be issued shortly.

Opera Glasses for Theatre-goers.—The great "Druriolanus" is stated to have initiated another popular reform. Every stall in the Covent Garden Opera House and in Drury Lane Theatre will shortly be furnished with opera glasses, so arranged that upon the occupier of the seat dropping a sixpence through a slot the glasses will be automatically released, free for use. Theatre-goers will, no doubt, appreciate this new departure for their comfort and convenience, and at the same time Mr. Augustus Harris should reap a rich harvest.

Charge against a Sheffield Manufacturer.—At Sheffield Town Hall, on September 30, Mr. William Williams, manufacturer, of Howard Lane, Sheffield, was charged with receiving a quantity of plated goods, the property of Messrs. Mappin Brothers, silver-plate manufacturers, of Baker's Hill, knowing them to have been stolen. Three men—Raines, Hampson, and Bardwell—gave evidence, and acknowledged that they had sold numerous stolen articles to Williams, the goods all having the prosecutors' mark on them. The accused was committed for trial, bail being allowed.

Absconding of a Maiden Lane Diamond Merchant.—The diamond men of New York are said to be greatly excited over the disappearance of Emil Von Gelder, the manager of Von Gelder and Son, diamond merchants, Maiden Lane. It seems that the youthful manager has been buying diamonds freely on credit recently, until the collected value was 40,000 dollars, when he decamped. Von Gelder's father lives in Amsterdam, and is said to be very rich. The levanting manager was to have been married on the 23rd of this month, and his *fiancee* is said to be sparkling with diamonds when out riding in the park.

The Largest Clock in England.—There is now on view in the factory of Mr. J. W. Benson, of Ludgate Hill, a clock which claims to be the largest in England. It has been designed for the new Portsmouth Town Hall and, expense being a matter of secondary consideration, no pains have been spared to secure the best material as well as the best workmanship. All the parts usually made with brass are of forged gun-metal, and all the pinions are of the hardest steel. The clock will record the time upon four dials each 13ft. in diameter, and will strike the hours and quarters. The mechanism, without weights and pendulum, weighs two tons.

This would apply at Home.—Our consuls abroad, says the *Philadelphia Keystone*, ought to be told to change foreign values into those of this country when they are writing their reports. Of course, when our consul at Tokio tells us, for example, that imports of clocks from the United States to Japan in 1888 exceeded those of the previous year by 92,000 yen, and we know that a yen is worth a trifle over 73 cents, the thing can be figured out pretty quickly to show that the gain was about 68,000 dols., an increase of over 42 per cent.; but if the consul had made the calculation once and incorporated it in his report, that once would have saved the doing over of the same work by every American whose business or pleasure it was to find out what 92,000 yen meant in Uncle Sam's dollars. The government should instruct the consuls to write United States.

Sheffield Plate.—Our correspondent "Vindex," says the *Sheffield Daily Telegraph*, is quite accurate in his defence of the electro-plate trade in Sheffield. No one with a knowledge of the two towns would bid Sheffield take a seat behind Birmingham in regard to silver plate. There is, unfortunately, a considerable quantity of cheap and poor plate manufactured in Sheffield, but this is in obedience to the irresistible law of supply and demand; nevertheless it is not anything like the quantity of common plate made in Birmingham. Without denying that there is some very rich and beautiful electro-plate manufactured in Birmingham we may, without exaggeration, say that, as a rule, when people want cheap plate they go to Birmingham, and when they want good plate they come to Sheffield. A striking testimony to Sheffield's high reputation for plate was recently given in a London Police Court, during the hearing of a charge of theft. The prosecutor explained that the electro-plate stolen was of the best quality—it was Sheffield. This was accepted as decisive of the question of quality. It behoves Sheffield firms to maintain this reputation. As a whole we believe they are doing so, not only by the high standard of workmanship and quality, but by their industry, enterprise, and activity in cultivating as purely artistic a taste as the public can be induced to look at.

Old Silver.—It is quite true, writes a correspondent of the *Pall Mall Budget*, that there have been great frauds in the supply of old silver to dealers and pawnbrokers. The only wonder is that fraud was not suspected long ago. Wherever there is a demand for a special thing in London, there is sure, in a short time, to be a supply of it. A dozen years ago there was a demand for Chippendale, six years ago there was a demand for Bartolozzi; now there is an amazing supply of both. So it has been latterly in the case of old silver. The old work was good work, just as the mouldings in the panels, or the stucco work in the ceilings of a house built 150 years ago, are pretty sure to be good. Those were not the days of general information or belief in the teachings of the art critic. But we have got both now, and a good deal of fraud thrown in to sweeten the bargain. For people who don't know when silver is good believe that they can tell when it is old—and that does just as well. Those hall-marks were for them surely a blessed fact. And if the letter in the mark points to the year 1704, why no one can deny but that it is a genuine piece of Queen Anne plate. And London is now splendidly stocked with genuine pieces of Queen Anne plate. It is quite refreshing to think of the wealth of old silver that is seeking purchasers at 45s. and 60s. an ounce. One way it is done is by getting a little piece of true Queen Anne, cutting out the mark from it, and letting it into the bottom of a much heavier piece of our own Sovereign. So the purchaser buys in comfortable assurance that the hall-mark is everything. The moral is simple enough; very dangerous, indeed, is a little learning. The fraud just detected will do great good if it keeps tastes in bounds and makes people look more to the gold than the guinea stamp.

The Diamond Market.—The usual Cape steamers arrived during the month, but, bringing only a very limited supply, prices for *rough* were steadily maintained, and even higher quotations were the order of the day, which caused much complaint from the numerous dealers on the market, notwithstanding which, considerable business was transacted.

The *Amsterdam* market has been quiet, on account of the Hebrew festivals. *Rough* and *cleavages* are in good demand, and their high quotations are maintained, in reference to which *De Diamant* says, "Buyers should become used to the high prices, notwithstanding the difficulties encountered at first." Certainly there does not appear to be much chance of a fall while the supply is so limited.

Paris reports summarised are: Increased sales for cut goods, Russians and Americans being the principal purchasers. Trade for both local and foreign markets increasing steadily, and still better trade expected at the end of the year.

Metals.—Latest official quotations to hand are: *Silver.*—Bars, 43⅛d. per oz. *Copper.*—Chili bars, G. O. B.'s and G. M. B.'s, cash, £42 17s. 6d. to £43 5s.; three months, £41 17s. 6d. to £42 5s.; Australian nominal. *Tin.*—Fine foreign, cash, Straits, £90 7s. 6d. to £90 17s. 6d.; Australian, £91 2s. 6d. to £91 12s. 6d; three months' Straits, £91 to £91 10s. *Lead* is steady. Spanish soft, £12 10s.; English £12 12s. 6d. for ordinary brands. *Spelter* is firm. Ordinary brands, £21 17s. 6d. to £22 2s. 6d.; special, £22 2s. 6d. to £22 7s. 6d. English soft, V. & S., £23, Swansea. *Quicksilver.*—The importers' price is £9 5s.; and that of second-hand holders, £9 1s. 6d.

TRADE NOTES

Presentation to Lady Willis at Portsmouth.—The Guildhall, Portsmouth, was filled with a large and representative assembly on the 15th ultimo, on the occasion of the presentation of a testimonial to Lady Willis by the inhabitants of the town. The testimonial consisted of an ebony clock, artistically mounted in silver, standing on a base with silver feet. On the front of the base are two chased silver nerieds in a reclining position, supporting a well-shaped shield, which is surmounted by the borough seals and arms. On each side of the dial is a silver Corinthian column, 15in. high, supporting a carved ebony entablature. The dial is of silver, with dark Roman numerals, and blue steel hands. On the dial is engraved a view of Government House, and on each side of the dial are wreaths of flowers in chased silver. On the summit of carved ebony are two modelled Arcadian figures, between which is a silver cherub, supporting two silver shields, on which are engraved the arms of the Willis and Neeld families. The entablature is surmounted by a silver gallery, with a silver figure of Fame, standing on a silver sphere. The clock is furnished with sweetly-toned bells, which strike the hours and quarters, and a deep cathedral gong. On the shield is engraved the following inscription: "Presented to Ada Mary, Lady Willis, in supplement to public demonstrations of respect accorded to herself and Gen. Sir George Willis, K.C.B, on his retirement from the command of the Southern Military District, by numerous friends in Portsmouth and its vicinity, as a farewell token of esteem and regard, and in recognition of the kind and graceful part taken by her in promoting the social enjoyment and general benefit of the community of Portsmouth during her residence at Government House from 1884 to 1889." It was supplied by Mr. Cairns, of 105, High Street, Portsmouth.

Mr. Frederick B. Box informs us that last month he sold and transferred the large and well-known business of Mr. D. C. Hildyard (two shops), 11, High Street, Colchester, and Long Wyre Street, Colchester, to Mr. W. Zimmerman, late of Fulham Road, S.W., the valuation of stock and fixtures being made by Mr. Box and Mr. W. Bryer, of Barbican, E.C., on behalf of the vendor and purchaser respectively.

The Cheshire County Chess Challenge Cup.—This is at once undoubtedly an exceedingly tasteful and as unique piece of silverware, being bold and original in conception and exquisite it finish and effect. It is a massive silver vessel of great value. The body of the cup is shaped like a Staunton pattern "rook," or castle, the battlements forming the lid. Above the lid is raised a dome of polished silver on the summit of which stands a crowned figure draped in royal robes and bearing sphere and sceptre in hand, being a symbolic embodiment of the King of Chess. Between each embattlement is a shield on which to register the names of winning clubs. A large chess board, richly enamelled in black and white on a gold ground stands forth conspicuously from the upper portion of the obverse of the cup, and on the centre of the board the Cheshire Arms are emblazoned in the proper colours, in gold enamels. Below this appears a large gracefully curved shield-like panel, whereon two mounted armoured knights, each caparisoned *cap-a-pie* are doing battle, these being depicted as the mimic warfare of the ancient game. A similar panel adorns the reverse of the vessel and on this is engraved the following inscription :—" Cheshire Chess Association Challenge Cup. To be competed for annually by the Chess Clubs of the County of Cheshire and held for the year by the winners. First holders, the Birkenshaw Chess Club, 1889." Round the base are arranged groups of Staunton chessmen, each piece being represented four times. The base itself is decorated with small shields and elliptical spaces surrounded by floral ornamentations. These shields and spaces are intended for the reception of inscriptive records, for which purpose ample provision has been made. The whole surface of the body between the base and the embattled lid (except the parts covered by more imposing embellishments), is chequered with alternate squares of bright and frosted silver, and the spaces above each shield are filled in with two embossed crowns, suggestive of the royal descent of the pastime : while the cup itself is completed by a pair of gracefully curved and foliated handles, whereby the splendid trophy can be lifted to the thirsty lips of the triumphant winners. The entire adornments are throughout raised, chiselled, chased, and embossed in the highest style of the silver worker's art. Messrs. Fattorini and Sons, of Bradford, have made the cup from designs supplied to their suggestion by Mr. Arthur North of the same town, and the outcome of their labours is well worthy of the high reputation of the firm.

Board of Trade Returns.

THE clocks and parts thereof imported in September, says the Board of Trade Returns, amounted in value to £35,430, in comparison with £31,562 in the same month of last year, and £33,772 in 1887. The following shows the sources of the supply :—

September	1887.	1888.	1889.
From France...	£15,763	£13,718	£14,762
,, United States... ...	£9,393	£5,616	£5,326
,, other countries ...	£8,616	£12,228	£15,342

For the nine months of this year the clocks imported have reached the value of £311,979, while the figures for the same period of last year were £320,123, and for the same months of 1887 £278,540.

The watches and parts thereof imported in September valued £59,958, against £48,228 in the same month of last year, and £56,252 in the September of 1887. The first nine months of this year give a total of £515,284. In the same period of last year it was £446,145, and for 1887 £538,882.

The plated and plated and gilt wares exported during September amounted to £36,665 in value. The same month last year gave £30,366, and September, 1887, £29,878. The first nine months of this year show a total export of £293,650, in comparison with £266,885 in the same period of 1888, and £215,554 in the same months of 1887.

The imports of every kind of produce in September reached the respectable figures of £33,382,561, against £28,414,372 in the September of last year, and £27,191,594 in that of 1887. For the first nine months of this year the total is £309,816,121, in comparison with £278,622,431 for the same period of last year, and £264,037,010 for that of 1887.

The British and Irish produce and manufactures exported in September reached the value of £19,637,384, against £19,603,660 for September of last year, and £19,833,830 for that of 1887. The first nine months of this year show the good total of £182,001,713 of exports, in comparison with £174,271,542 for the same period of last year, and £163,099,414 for the same months of 1887.

BIRMINGHAM NEWS

FROM OUR CORRESPONDENT.

THE sanguine tone of the last few months seems to be on the increase, or perhaps it is more accurate to say, is being verified and has become an absolute fact. All branches of the gold and silversmiths' trade are fully occupied "at unremunerative prices," so we hear, but this can't be correct in some cases, as I know of at least, two instances of manufacturers having become the lucky possessors of a horse and carriage since I last wrote ; I presume these gentlemen do this on their losses. Well, it don't much matter, I suppose, what you call the money you make during the year so that it is enough to live upon and keep your pecker up, eh ? As an outcome of good trade, I presume, comes a pretty strong application from workmen for a rise in wages, one or two instances of the whole staff of workpeople applying at once for a rise is something approaching a strike ; as near a strike as it is possible for the jewellers ever to reach in the opinion of some of us, though I don't see why the jewellers should not be able to summon up pluck enough now the school boys have set them such a good example. So, now then, goldsmiths, silversmiths, engravers, setters, polishers, case makers, turn out all of you like men and get back your old prices for both yourselves and masters, for as sure as there is a God above you this is the only way to get back your good old times when a jeweller was considered a respectable person and could earn his £5 a week and spend it too ; that was the mistake.

* * *

THE people who are doing the biggest turnover are doubtless those who are offering the greatest quantity of novelties at the smallest prices (for is not the world mad upon new things at the present time from the Eiffel Tower down to the last thing in safety pins ?) Messrs. G. E. Walton and Co. are to the front in this line of business, and " Walton's Novelties " has become a trade expression and not without cause. One of their latest important lines is in drawing-room clocks with metal frames, parcel gilt and prettily decorated ; they have been a thorough success ; their sales for last month reached a total of 1,000 clocks.

* * *

SOME stir is also being made in the Birmingham watch trade ; the English Watch Co., Villa Street, report having done 25 per cent. more business during October than during the corresponding month last year, notwithstanding the fact that they have given up the whole of the mechanical work they were then doing, which was nothing to do with watches, so that the bonâ-fide increase in the sale of their watches must be something considerable.

* * *

THE pressure on the Assay authorities to get work marked has increased tremendously during the last few weeks ; the crushing and scrambling of porters and errand boys to pass their parcels for marking to the official in charge, and to get them back again in the evening, has been the cause of several ebullitions of temper on both sides, which suggests that an improvement in the system is urgently needed, both in the interest of manufacturers and the Assay officials themselves.

* * *

THE streets themselves in the jewellers' quarter appear to be assuming their once busy condition of years ago ; the foot passengers with sprightly step more numerous appear upon the brick-paved path, while the rattling cab goes dashing past with the impatient and pushing traveller on the look-out for fresh lines for his stock which has just come home, and the careless "errand kid" goes whistling up the street, and leaves his parcel on a neighbouring window-sill. Such is life, or at any rate one piece of it.

Midland Jottings.

THAT the trades represented by *The Watchmaker Jeweller and Silversmith* are experiencing to the full the benefits of the general revival chronicled in our last and previous issues goes without saying. But, in order to realise the evenness and extent of that same, one must be in the midst of the actual manufacturers and the larger factors; in absolute touch; rubbing shoulders with them, metaphorically speaking.

In the Midland district—being Birmingham and the "adjacent isles"—orders are coming in from all the manufacturers of the fancy trades at a rate that makes it pretty certain a good many of them cannot possibly be executed in the time required, and this notwithstanding that full time and late hours are the order of the day.

Perhaps, if there is any difference to be noted in the demand for all classes of goods, the greatest revival is shown in the better class jewellery; while "rubbish" is distinctly at a discount, an immense increase is shown in the number of orders for gem work of every description. Setters are consequently having good times; in this work, brooches, bracelets, and even earrings are in request. A return to the fashion for the old forms of round and oval brooches, both plain and set is widely observable.

While on the subject of trade revival, it is sufficiently curious to observe that when trade is good, payments are difficult to obtain, but when bad trade prevails settlements are comparatively easy. Why should this be? Has it anything to do with "Long Terms and the Accommodation System" so ably treated by another correspondent in this and last month's journals? Certainly it would seem that the manner in which large parcels are crammed into buyers by some firms, can be productive of anything but good in the way of obtaining prompt settlements and in busy times the evil would be necessarily aggravated.

How those firms, whatever be their capital, or stock, which comes to the same thing, find it to their interest, if they really do find it so—to encourage such a system of doing business, is, at any rate, a puzzle to more than a few manufacturers who conduct their trade on rational principles; in fact, the latter go so far as to aver emphatically that the system does not pay any profits at all, which seems only feasible when it is considered the number of small men who are supplied with ten times or more the amount of stock they can possibly carry—and pay for. Besides being what certainly appears (in the absence of any apparent reason for it) an idiotic method of doing business, it is utterly ruinous to the smaller manufacturers.

The Birmingham branch of the Commercial Travellers, Benevolent Institution is situated at 6, Quadrant Chambers New Street. We are sorry to hear it stated that this deserving institution receives little or no support from travellers engaged in the jewellery trade. Birmingham Jewellers' Travellers please note the address; if your "screws" are inadequate, you will be all the more likely to come into the category "aged and necessitous" when your time arrives. Some of the jewellers' ladies, we are glad to see, are taking considerable interest in the institution.

The Prescot Watch Trades' Association held a large meeting during the month for the purpose of calling attention to the necessity of exercising renewed vigilance with respect to the importation of foreign watch movements and strictly enforcing the clauses relating to the same in the Merchandise Marks Act. This action was, it was stated, rendered necessary from the fact that it had come to the knowledge of the Association that a large number of foreign movements had been recently imported into this country with the intention of putting them into English-made cases and selling them as English watches.

In this connexion, Coventry was mentioned in such a way that manufacturers of that town have thought it necessary to mildly enter a protest against what they evidently inferred as an insinuation against them, and have stated that none of the movements referred to are likely to find their way into the hands of Coventry makers.

Some slight excitement (as usual, made the most of by the local reporters) was caused among Birmingham jewellers, in the middle of the month, by the knowledge that a "wolf in sheep's clothing" was in their midst, in the person of a fellow attempting to obtain goods on various pretexts. His principal *modus operandi* seemed to be that of getting hold of some retailers' business cards, and going round to the wholesale houses as the shopkeeper's representative. His depredations in this direction didn't extend far, however, as he was promptly "nailed" (after a previous attempt) by Messrs. Mantle, of Warstone Lane. While the door of the room in which he was confined was being guarded, pending the arrival of the official in blue, he managed to escape through a window, and so is still at large, and though Bobby is "on his track," it is probable that he promptly left the neighbourhood.

Messrs. B. H. Joseph & Co., of 20, Frederick Street, Birmingham are quite in full swing, manufacturing their latest designs in moonstone and diamond jewellery, of which they report that the demand exceeds the supply, and which demand they expect will last until the market is glutted by other manufacturers, who "go and do likewise"—an estimated period of some six weeks from the introduction of similar novelties. This jewellery is likely to have quite a run during the winter season; it is certainly very chaste and very beautiful, and the workmanship—well, the name of the firm is a sufficient guarantee of that.

Birmingham jewellers and silversmiths in search of novel ideas for working up designs (and what jewellers are not?) are here reminded that they will shortly have two good opportunities for obtaining such. The newly established Baseball League will shortly hold its next meeting at Aston, and a Hockey club has taken up its head quarters at Edgbaston. Should either of these games "catch on" (the expression is perhaps allowable in connexion with the former game), designers will have a fresh field wherein to seek for emblems with which to adorn trophies, &c.

Another proof, if any were wanting, of present trade vitality: Warstone Lane assayers and refiners report that at no time recently have such large quantities of gold and silver been passing from them to manufacturers. This is solid testimony as to the volume of trade being done, not statistics; manufacturers don't buy gold to lay by.

The Birmingham and Midland Bank (Limited), have opened another branch in the centre of the jewellers' quarter, and Mr. J. M. Madders, manager of the Waterloo Street branch, will also manage the new office. This departure is very well received by the trade, as it is seen that it will obviate the necessity of going or sending to the centre of the town for every monetary transaction in which a bank is intermediary. The new offices, situated at No. 2, Vyse Street, have been named "The Warstone Lane Branch," and will be essentially the jewellers' bank. This old-established bank has evidently recognised the policy of catering for the convenience of jewellers and watchmakers, as in the beginning of the year it took over The Coventry Union Bank, at the corner of High Street, Coventry. It is to be hoped that jewellers and watchmakers will promptly acknowledge the compliments thus paid to their importance as a body, by transferring their accounts to this enterprising institution.

An order has just been received in Birmingham for 50 pairs of earrings for Johannisberg, South Africa. They are to cost £50 a pair; by the time they get to their destination their price will probably be more than double that figure. Evidently the new countries are the field for the enterprising jeweller to push his wares in.

Further Midland Jottings.

By W. Kineton Parkes.

"WHAT is the state of trade?" I ask jewellers, and they answer with pleased expressions, "Good." This looks well, for jewellers and farmers are proverbially the most pessimistic of all the the children of the earth. Farmers, I believe, have ceased to grumble, and jewellers say "Good!" It follows, therefore, that things are "looking up." Yet there are still complaints to be heard: complaints of the competition and the cutting which is still taking place, and spoiling much good business. I heard of two houses in the trade who were cutting against each other over a line of gold bracelets in a most immoral way. It does seem absurd! There is scarcely a margin of profit, and the goods must be made in the most out-of-the-way holes, by the poorest of garret makers, or they could not be sold at the price or anything near it. This is carrying the thing too far, and some Birmingham jewellers are emulating London tailors, and "sweating" their outworkers in a way which is quite uncalled for, and at the same time very wrong. Better reports from London are received here at the present time than have been heard for many a day, and the reports from the Metropolis are better in this respect than from the Provinces. The lace and cotton industries are not so brisk as many other trades, and this, of course, interferes with the satisfactoriness of the provincial trade in jewellery. From our own district we hear of an advance in fuel, which, of course, adds to the cost of production, and necessitates an advance in prices, which is also called for by advances in raw materials. So far, buyers fight shy of ordering at the higher prices, but this is a good sign, for sudden leaps are much less preferable than a steady advance, and this we seem to be getting at the present time.

Best quality diamond work is in good demand, and is fetching reasonable prices, as is also the better class of fancy jewellery. On pieces of from £15 to £60 good profits are being realised, and the number of such pieces required seems to be constantly increasing. Comparing this period with the "busy time" of last year, a great improvement is apparent. A very considerable increase, both in the turn-out and the sales has taken place, and a much larger quantity of jewellery is being made, than was the case in the corresponding period of 1888.

A little while ago, some of the larger firms were seriously thinking of the American "shut-down" principle, which consists of the closing up of various establishments for two or three months during the quiet time. A similar system holds in Paris also, where in "the season" some 150 to 200 hands will be employed in one house, but as the season declines, the number is reduced to 50 or 60, while those turned away form the floating population always apparent in Paris, who do no work during several months of the year, and become the material upon which the Socialist demonstrator works. In America however, these people turn their hands to other occupations. Go into the country and chop work, and in other ways recruit their health, and prepare for the next busy season. All fears are over, however, and workmen are now busily employed, and in very many cases doing "overtime."

The Jewellers' Art Classes in Birmingham are in a most flourishing condition. The number of students has risen from 90 last session, to 153 this session. This is a splendid result, and gives great promise for the future. The classes are organised by the Jewellers' and Silversmiths' Association, and a circular signed by Mr. Chas. Green, Mr. J. Millward Banks, and Mr. J. William Tonks, was sent out at the beginning of September to all the jewellers and silversmiths in "The Quarter," requesting them to place a Notice, which accompanied the circular, in a prominent position in their manufactories.

The manufacturers are also asked to furnish the honorary secretary of the Association with a list of the students from their works who will be able to attend the classes. The manufacturer is asked to pay half the fees—which amount to about 3s. the two terms—and the Association contribute the other half. Arrangements are made with the Municipal School of Art for the supply of a competent staff of masters, and this year, in addition to other arrangements with the Municipal School, provisions have been made for the admission of female students. The conditions of the trade of the district seem to make this desirable, and the Association trusts this will be taken advantage of very largely.

It is a significant point in this movement that the students are approached through their employers, and it is the employer who gives the direct incentive to his employée to engage in this work. On a form supplied for the purpose, he enters the name, address, age, and trade of each of the men or women in his employ who are willing to attend the school, and in this way a direct interest is established between employer and employed which cannot help but be of the greatest advantage to both parties concerned. The school goes on merrily at the present time and the number of students next session is expected to be 250. The head master of the central school, Mr. E. R. Taylor, is supplied with papers containing full particulars of the movement, and I believe is taking a very active interest in the extension of it.

Prizes are given by the Central Art School to all students who pass the examination, and in addition to these, the Association propose at the next examination to award a series of special prizes which will have a distinct relation to the industries in which the students are engaged. The increasing attention which is being given in other centres to the question of art education and technical training, and the growing demand for artistic jewellery, personal ornaments and plate, make this a matter of paramount importance, and the Association looks to the trades generally for their help and co-operation in the furthering of the systematic training of artisans and young people, so that they may pursue their avocations with artistic knowledge and feeling, and thus compete successfully with other countries in the world's markets.

The classes are held at present in the Board Schools in Ellen Street, which is adjacent to the jewellers' quarter, but now that the Technical Instruction Act has become an actuality, it would seem to be an excellent thing to acquire a building in which the school might establish itself, and thus become "The Birmingham Jewellers' and Silversmiths' Technical School," in which all the subjects in any way connected with the trades might be taught—design, modelling, repoussé, die-cutting, heraldic work, and the rest. The syndicate of Paris jewellers have such a school, and the "Ecole des Arts Industriel" is a well-known institution at Geneva, and both these schools have important exhibits at the Paris Exhibition. There is no reason, therefore, why Birmingham should be behindhand in this matter. The jewellers and silversmiths also have a great advantage over most of the other industries of the city, in that they have a strong Trades' Association, from which stronghold they can approach the Government on the Technical Instruction question. Unlike the brass founders, or the glass blowers and others, the jewellery trade is an "organised trade," and this I believe is a *sine qua non* with the Government in this matter. The jewellers have therefore organised just in the nick of time, and they should certainly apply to Government, who will grant powers to the Corporation to enable them to proceed in the matter. We hope before very long that the matter will be taken up and the formation of the School in a fair way to become an accomplished fact.

There seems to be some considerable amount of discussion concerning the awards to British exhibitors of jewellery, personal ornaments, plate, &c., included in Classes 24 and 37. Especially is this the case in the former Class, in which the only medals awarded to British exhibitors were bronze ones. In Class 37, the Goldsmiths' Alliance and Mr. J. M. Crouch obtained silver medals, and the Goldsmiths' and Silversmiths' Manufacturing Company, a gold one. One or two bronze medals were also awarded in this Class. The discussion is on the question as to whether these awards were fair. It appears that in Class 24, no British juror was appointed at all at the time the arrangements concerning jurors was made. In Class 37, Mr. J. W. Tonks was the juror, and he was subsequently nominated to serve as an expert on the Class 24 jury also, but he had no vote on this jury. I called to see Mr. Tonks the other day, and I asked him if he thought the awards were unfair, and he replied that they were not intentionally unfair, but that the French jury did their best to be quite impartial in the adjudication of the awards.

As I mentioned in my last "Jottings," there is a decided tendency in Paris in favour of a clouded surface to silver, which is very largely in vogue with the French silversmiths, but which has not been touched yet by British makers. The juries consequently were prepossessed, and naturally so, with this work, and they were, therefore, somewhat chary in admitting the excellence of other descriptions. They cannot be credited, Mr. Tonks thinks, with any blame in the matter, however, for, from his own observation when visiting the Exhibits in Class 37 in their company, they were perfectly ready to admit the beauty of the British pieces, and were only too willing to listen to whatever the British representative had to say for his national work. English workmanship has not suffered from its comparison with Parisian handicraft. The French exhibitors appear to have concentrated all their powers on elaborate single pieces of immense value. Pieces which only the very richest and most enthusiastic of virtuosos would ever dream of purchasing. Of course, these pieces are of great beauty, and the detail upon them is quite extraordinary, but it would almost seem that they should be put in a separate class, for they can scarcely be adequately judged along with the more general lines upon which the British exhibits were kept. English jewellers and silversmiths are perhaps not quite satisfied with the awards given to the home productions, but they must bear in mind that there is no slight intended, and that it is more a matter of taste than of intrinsic excellence.

In connection with the subject of jurors at the Paris Exhibition, some very funny stories have been told. One of the English jurors sent over to the 1878 Exhibition could not speak a word of French, and his French colleagues were situated similarly regarding their English; so that, as they did not employ an interpreter, their mutual consultations were conducive of but little result, either to themselves in the formation of their judgment, or to the exhibitors thirsting for awards. Another juror was from Italy, and, although he knew English, his French was so rusty that he gave up the thing in despair, and exclaimed, in his native tongue, "Send me back to Italy! I must be sent back to Italy!!" And it is on record that he was sent back. Of course, the moral is very plain: send jurors only who can speak the language. The English juror for jewellery and allied trades in this Exhibition, fortunately, was a very good Frenchman.

I saw some exceedingly pretty bracelets at Mr. J. Wainwright's warehouse in Warstone Lane the other day, when I called to see how the bracelet, brooch, and breast-pin trade was off for orders. There is a falling off in the sale of the thin wire bracelets, but the Etruscan-work gold bracelets still find the greatest favour with buyers, and there is an excellent sale still for the better qualities of these designs. They have had an excellent run for years, and there is no apparent falling-off in the designs; in point of fact, there seems still to be a growing demand for them. Some of the breast-pins I saw were very neat. Pearls are very largely used just at the present time, although diamond pins are always in demand. Half-a-dozen small pearls, with a larger one in the middle, make an awfully nice pin, and the head may be used for a shirt stud, as the pins are removable, and a stud back is always supplied with them. In brooches, there is nothing very decidedly new just at present. Among the older designs there were some pretty things, and there seems to be a tendency in favour of enamelled designs. From enquiries which have lately reached Mr. Wainwright, it would seem that earrings will again become fashionable.

Messrs. N. C. Reading & Co., of Warstone Lane, are working overtime, and up to their full capacity. There is a great demand for silver alberts of the cheaper kind for ladies, and it is as much as Messrs. Reading can do to execute the orders they have in hand.

A very interesting pamphlet has just been sent to me by Messrs. Cassell & Co., of London. It is by Dr. Charles Bell Taylor, the eminent ophthalmic surgeon. Dr. Taylor is well known as an authority on the eye and its defects and diseases, and his remarks on "How to select spectacles in cases of long, short and weak sight," will be read by all who are engaged in the spectacle trades with interest and profit. The pamphlet consists of a lecture, which was one of a series on Diseases of the Eye, delivered at the Nottingham and Midland Eye Infirmary, and is well illustrated by means of woodcuts, which are useful in conjunction with the remarks in the text. The writer deals with the various forms of myopia, hypermetropia, and astigmatism. The remarks on astigmatism are particularly interesting. When the lecture was given at the Infirmary, Dr. Taylor was fortunate in having present, persons who were afflicted with the various malformations of the eye of which he was speaking, and it adds to the value of the pamphlet, that these examples are well and faithfully described therein. The pamphlet has now reached a second edition, which proves that Dr. Taylor's words are appreciated at their proper value. Dr. Taylor was at one time President of the Parisian Medical Society, and is now Consulting Ophthalmic Surgeon to the Nottingham Union Hospital, and the Midland Institution for the Blind.

Another book on optics hailing from the Midlands is "The Hygiene of the Eye," published by the Midland Educational Company, Limited, of Birmingham and Leicester. This book is a translation, edited by Mr. W. P. Turnhall, of Dr. Hermann Cohn's work. Dr. Cohn is a well-known authority on the eye, not only on the Continent, but in England also, and his book is welcome. The translation has been done well, and Mr. Turnhall's editorial work is excellently carried out. The book is in 22 chapters, and is plentifully supplied with explanatory illustrations. The chapter on hereditary myopia is a little indefinite, but this one would expect, taking into account the uncertain state of knowledge at the present time concerning heredity. The greater part of the book is concerned with the eyes of school children, and the text of the whole book might be found in the words, "prevention is better that cure." The whole question of school furniture is gone into, and slates, desks, print, and paper, as well as many other things, are discussed. A feature of the book is the size of the type with which it is printed, and which renders it very pleasant reading.

Fraudulent Trade Marks.

PUBLIC attention is once more being forcibly drawn to the wholesale piracies of English goods, and more especially of Sheffield cutlery and hardware, by German rivals in Solingen and other continental towns. The practice is carried on with the utmost coolness and on the most extensive scale. It has been stated in evidence over and over again, that there is a most settled purpose on the part of the Germans to build up their cutlery and hardware trades by taking advantage of the reputation obtained by the Sheffield manufacturers. A recent traveller to Solingen, who managed to obtain access to several of the cutlery workshops there, found piles of rubbish manufactured in blank waiting to receive some English mark which would enable the wares to be palmed off in distant markets. Nor is this the worst of it. The Germans go farther than to sell as "Sheffield made" goods which have never seen Sheffield. They make two classes of articles—an inferior description which they stamp with Sheffield, or imitation of Sheffield marks, and put up in close copies of Sheffield labels, and, while offering these to the purchaser, they strongly dissuade him from buying them. They then produce their best goods, which they recommend as far superior to Sheffield work. As a rule, the customer is persuaded to follow the traveller's advice. If he disregards his counsel, and invests in the cheaper class, the purchaser finds himself wofully deceived, and the spurious rubbish makes him determined to have nothing more to do with this so-called Sheffield cutlery. The weapon used by the German is, says the *Engineer*, thus double-edged; either way he wins. If he sells his dear goods he is alright; if he sells his rubbish, he deals a blow—a foul blow—at Sheffield, and looks forward to the customer being so incensed, as to steer clear of English cutlery in the future. In Austria the situation is very similar.

Workshop Memoranda.

To Clean Brass Clock Dials.—The following directions were given recently in the pages of a contemporary:—Take the corner pieces from the dial-plate, and also the ring on which hours, etc., are engraved. Remove all the old lacquer with hot solution of potash. Use a scratch brush to get into the crevices of the corner-pieces. When clean, brush them up successively with flour emery, bath brick, and then rottenstone, using a dry brush for the finish. They may then be dipped in hot soda-water, and then cold water; this will render them free from grease. Warm them slightly, and lacquer with "deep gold lacquer." The main plate may be treated in the same way, but instead of using a scratch-brush, take fine emery-cloth, taking care to give the surface a uniform series of up and down strokes, so as to secure a uniform grain. When quite clean, this plate may be lacquered with pale gold lacquer. The hour-ring is best done in the lathe. A piece of finest glass-cloth applied by hand will lay the grain on in a circular form, and give the dial that radial reflection often seen on barometer and other work. The whitening or silvering may be done as follows:—Take a small quantity (say ½oz.) of nitrate silver crystals, and, say, 1 oz. of common salt; powder them, and add enough water to them to make a fluid paste. Revolve the circle slowly in the lathe, and apply the paste with a piece of old linen rag made up into a ball. The whitening will gradually come out, and the plate can then be well washed under a water-tap. It may then be warmed and lacquered (by preference in the lathe) with white or colourless lacquer. In carrying out the above instructions observe three points: 1. Finish nothing to an absolute polish, but whatever surface you arrive at let it be free from grease. 2. Don't finger any of the surfaces which are to be lacquered or whitened. 3. See that whatever treatment you give to each portion of the dial is uniform, or failing that the final effect will not be good. To clean the hands, prepare them on a finer emery bob, without oil or grease, till they are a thoroughly uniform white colour. Make a sand-bath and place the hands in it—in a few minutes they will begin to get a straw or yellow colour; move them about to a cooler or hotter part of the bath, as the shade on one portion of it deepens too quickly, or not quick enough. When the required colour is reached, take them up with the pliers, draw a candle down them, and finally clean off with an old leather, etc.

Paris Fashions.

THE Paris correspondent of the *Jewellers' Review* gives, in the following interesting article, some particulars of the fashions now dominating in the French capital, which will perhaps be of some use to home jewellers:—

The bracelet *Ville de Paris*, souvenir of the exhibition, just out, is a jewel very finely finished, in fact too finely finished, in my opinion, to sell well. It is of polished silver, bamboo style, the two branches united by a shield bearing the town coat of arms, in gold. All around the coat of arms and branches are silver stars in *repoussé*.

A shell brooch of polished silver is the latest out in Eiffel Tower styles. One, with the ground work of the shell slightly hollowed, has a gilded Eiffel Tower, and around the shell are gold stars. I have not yet seen anything so charming nor so cheap in Eiffel Tower jewellery.

The renewal of the "Mascotte" at the Bouffes has given a new lease of life to a host of jewels lying tucked away in drawers, &c. In fact, within the last few days there has been displayed in jewellers' windows the bracelets, collars, &c., which were created by this piece.

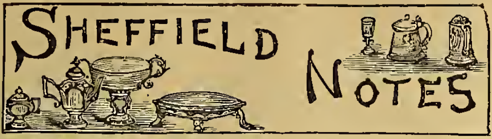
The lion and the sun are the well known arms of the Shah of Persia, and it was naturally to be expected that something new would be brought out with these subjects. I have as yet seen nothing in the shape of the lion, but the sun has given rise to a host of creations in brooches and pins. The brooches are generally ornamented with coloured stones, while many are composed entirely of diamonds. In any case the jewellers are beginning to devote their attention to this, and may perhaps obtain better results than they have up to the present.

The Crescent was greatly out of fashion before the Exhibition, but it has, like other jewellery, been transformed and embellished. A very good invention has just been brought out, that is to suspend from the upper part of the brooch a kind of jewel, the combination of which can be varied *ad libitum*. It is sometimes a kind of night lamp of forged iron, or imitation silver, between the metallic branches of which are panes of coloured stones, producing a magic effect. Emeralds, amethysts and rubies harmonise with this combination. This kind of crescent pendants are artistic, as they have to be greatly reduced in size, the brooch being used for collar wear. These pendants can be varied in a thousand ways, and are always pretty.

The use of the cigar-cutter pendant has not been up to the present a great success; still, I notice lately that this fashion has greatly spread, and the models have infinitely multiplied. After the champagne bottle in simple oxidized or old silver, with no ornaments, there is now the champagne bottle with the neck in gold or silver, and in place of the cork there is an odd pearl, a piece of coral or amber. On the ground work, which is generally black, there are sometimes small stars in silver. Mechanical statuettes are now also used as cigar-cutter pendants.

At watering places, leather bracelets, in which the watch is placed, are greatly in fashion. Gents have large watches, and the larger they are the more select. They (the gents) have abandoned the town walking-stick, and only carry, during their promenades, the "Sarah Bernhardt" stick. This stick is short, and replaces the riding-whip. In place of the knob, there is at the handle a silver blade very slightly sharpened. Every day there are new inventions in bracelets—the round and renaissance shapes being most in vogue. On a cut-out ground-work a monogram or motto is placed. But for this kind of brooch a flower is the most suitable.

(To be continued.)



SHEFFIELD NOTES

FROM OUR CORRESPONDENT.

SHEFFIELD is a tolerably big place, but it cannot be said that our public institutions have kept pace with the growth of the town. We have a museum which is very much in the position of Artemus Ward's "small but healthy tiger"—that is, if not very extensive it is fairly good. Among other attractions, the collection of articles relating to the trades of the town is not only interesting but instructive. It occurred to Mr. Howarth, the curator of the museum, that this department might be considerably enlarged if British consuls abroad could be induced to pick up any articles which came in their way—the town, of course, defraying the necessary expenses. A request to that effect was accordingly forwarded to Lord Salisbury on July 20, to which a favourable reply has just been received. The letter, which was read to the Town Council by the Deputy Town Clerk, emphasises the condition that the museum should pay all expenses, a proviso which is to be "clearly understood." It also vouchsafes the information that in India and the colonies there are no British consuls, which may or may not be *germaine* to the contents of Mr. Howarth's letter. At all events, so far as these countries are concerned we shall have to get our specimens through the India and Colonial Offices respectively. The letter was ordered to be entered on the minutes, the Mayor expressing the opinion that it was very satisfactory.

IT is difficult to get at the exact truth as to German competition in the cutlery trades — whether or no Solingen injures Sheffield much in the foreign and colonial markets; one thing is certain, that a certain class of manufacturers here appear to be getting somewhat alarmed. Two of them went over to Solingen recently, and by some means or other obtained admission to some of the works there. What purports to be a narrative of their experiences has been published, and it is certainly not pleasant reading. Enormous quantities of low-priced and worthless cutlery are said to be sent out of Solingen with the name of Sheffield stamped upon it. These manufacturers saw it with their own eyes, therefore it must be true. They maintain that the dodge is to disgust their customers with the name of Sheffield, and then to send them a trustworthy article with their own name stamped upon it. As our manufacturers, however, could not have seen this with their own eyes, it must be a matter of mere speculation. As a matter of fact, certain users of cheap cutlery —the South Americans to wit—would have to be very badly taken in to be disgusted with anything. Allowing for some amount of exaggeration, there can be no doubt that some very sharp practice is being carried on at Solingen, in the matter of marking cutlery. There is, however, no earthly reason why we should put up our shutters on that account, although manufacturers are doubtless quite right to bear this state of things in mind with a view to devising a remedy.

SHARP practice is not confined to Solingen, as certain Sheffield pawnbrokers have learned to their cost. An enterprising individual has been going the round of the principal shops of the town with what purported to be articles made of silver as a cursory glance at what appeared to be the hall-mark would seem to indicate. He succeeded in netting a considerable sum before it was discovered that the supposed hall-mark was only a clever imitation. His knowledge of the matter was rather defective, as he had mixed the letters and marks of various years, and this led ultimately to the detection of the fraud, although not to the arrest of the swindler. He is still at large, and will thus be able to profit by the information contained in the Sheffield newspapers, who have obligingly told him how the marks ought to be arranged in order to be consistent.

TALKING about assay marks reminds me of the lecture which Mr. A. T. Watson has been delivering before the Literary and Philosophical Society, on the Sheffield Assay Office. Mr. Watson, who is the able head of that office, naturally goes in for the superior reliability of the English Assay, although some practical men are understood to prefer the "touch" which is the general test in France. The lecture was, moreover, virtually a history of the silver trade in Sheffield, and out of it has arisen, incidentally, a controversy as to the relative merit of Sheffield and Birmingham electro-plate. There can be no doubt about it, that we cannot compete with one particular Birmingham house, that makes a speciality of works of art, but leaving that out of account, there is no other Birmingham house of repute that could not be easily matched in Sheffield. A good many London shopkeepers are known to go much further than this, and to prefer the Hallamshire stuff to any other.

THE price of ivory is still going up, there being at the recent Liverpool quarterly sales an average rise of ten per cent. all round. The quantity offered the first day was only about fifteen tons, and as stocks are very low the natural result followed. There was, however, a smaller attendance than usual of Sheffield buyers, and many Continental buyers were also absent. The next event in the trade is the sale of Stanley ivory at Antwerp; but, whatever the quantities offered there, it is scarcely likely that prices will ever be permanently very much reduced.

THE paragraph in these notes last month relating to Mr. H. L. Brown's adoption of the electric light has had the effect of inundating that gentleman with enquiries from jewellers in all parts of the country. Mr. Brown, I understand, takes exception to my describing him as having followed the example of the Goldsmiths' Company in this matter. Of course, although the Goldsmiths' Company adopted the Incandescence lamps last April, and Mr. Brown has only just got fitted up with them, it does not follow that the latter was influenced by the former. In the early part of the year the Goldsmiths' Company moved into their new premises, which had to be specially fitted up for them. The Sheffield Electric Light Company were only then in a position to work Incandescence lamps, electric lighting in Sheffield having been previously confined to arc lamps, which are worked on a different circuit. As the long days were approaching, it was only natural that Mr. Brown, who already used the arc lamp, should delay being fitted up with the Incandescence lamps until the return of the long nights. Mr. Brown is well up to the times, and certainly does not bear the reputation of waiting for anyone in the adoption of improvements.

SPEAKING of the Electric Light naturally suggests the instrument by which the current is measured out to consumers especially as that instrument partakes more of the character of a clock than of a gas metre. In point of fact the makers in Berlin suggest that it should be hung by a clockmaker and this is a work of considerable nicety. The instrument, which is called an Aronmeter from the name of its inventor, Dr. Aron, of Berlin, has very much the appearance of a clock with two pendulums. When these two pendulums are evenly balanced they mutually counteract each other, and nothing is registered on the index dial. But if anything in the slightest degree interferes with the action of one of them, the other begins to register. When the wires of an electric light circuit are attached it has this effect, and the figures registered by the one pendulum are proportionate to the current passing through the other. Although Dr. Aron recommends the employment of a clockmaker to hang this instrument, yet the Sheffield Electric Light Company have not been successful in getting a competent man to do the work here, and have had to avail themselves of the services of a young German sent over for the express purpose of putting these instruments in working order throughout the country.

INQUIRIES throughout the silver and electro-plate factories bring out the fact that trade is exceedingly good. This is especially the case with spoons and forks, of which enormous quantities are being turned out—at some places managers claiming to have orders on their books to last two months. This, taken in conjunction with the almost phenomenal prosperity of the iron and steel trades, makes the outlook for the winter months very cheering.

THE most important matter in connection with the history of the town during the past month has been the sale of the Duke of Norfolk's freeholds. Fully half the town is built upon the Duke's land, and a princely revenue has been derived from the ground rents. His Grace of Norfolk has certainly had no reason to be dissatisfied with the management of this magnificent property, but the general public have begun to grumble. Several cases of extreme hardship have resulted from the falling-in of several leases, and the consequence is, that the whole matter of leaseholds is beginning to be looked into. The Duke's agents are wise in their generation, and foreseeing the time when Parliament will be asked to deal with the question, they are taking time by the forelock, and selling out. But, whatever the motive, nothing but good can result from the step now being taken.

THOSE commercial men who, whether they are teetotallers or not, prefer to put up at temperance hotels, will now have an opportunity of doing so in Sheffield in first-class style. The new Albany Hotel has been formally opened, and is not only an ornament to the town, but has every appearance of being a commercial success. The Sheffield Café Company have spared neither trouble nor expense to make this last addition to their property perfect; and the result is universally acknowledged to be commensurate with the efforts put forth.

The Prescot Watch Trade Association and the Merchandise Marks Act.

RECENTLY it came to the knowledge of the Prescot Watch Trade Association that a large consignment of foreign-made watch movements had been imported into this country. Apprehending that attempts may eventually be made to violate the provisions of the Merchandise Marks Act, resulting in serious injury to the watch trade of England, the committee of the association have decided to take vigorous action to punish severely those who may be guilty of such fraudulent practices. Accordingly they convened a meeting of masters and men engaged in the trade at the Prescot Town Hall on the 9th ult. with the object of drawing public attention to the matter. The Rev. H. Mitchell (vicar of Prescot) occupied the chair, and there was a crowded attendance.

The Chairman said the Merchandise Marks Act was intended to make cheating such a dangerous occupation that it would have to be abandoned. However, from certain facts which had come to the knowledge of the association it appeared likely that the new law would have to be put into motion. Every British working man was deeply interested in securing fair play for his work; and one of the greatest objects of the association was to protect the Prescot watch trade from fraud. Masters and men alike were concerned in this question. If they remained inactive and confined themselves to hoping that other people would vindicate the authority of the law they would act most foolishly. Whenever a clear case of evasion of the act in connection with the watch trade was discovered the association ought immediately to prosecute the offender. He begged to assure the men that they would not be unassisted in the struggle. They must make a call upon every watchmaker in Prescot according to his wages, and the masters ought not to be backward with subscriptions. He could tell them that Lord Derby, their president, would not be slow to help them. He earnestly advised them to start a fund which would enable them to prosecute makers or dealers who defrauded the public by putting an atom of foreign work inside an English case. If such a fund were established, information might reach the association from many a confidential source, and afterwards they might verify the information for themselves. Every working man engaged in the watch trade must feel that they were fighting his battle, and although he might not dare himself to denounce his employer, as it might involve his own ruin, yet he could easily assist the association to get on the track of fraud.

Mr. Greenall addressed the meeting, remarking that the committee of the association had learned that an immense number of foreign movements had been secretly brought into this country. When people did things secretly it generally happened that they had an illegal design in view. There was not the slightest doubt that these movements would be put into English Hall-marked cases, and an attempt made to sell them as native manufacture. If the watchmakers allow such things to be done with impunity, the inevitable consequence would be that these frauds would ere long be practised on a most extensive scale to the great prejudice of the English watch trade. He appealed to them not to be indifferent or apathetic over this matter or allow the law to become a dead letter. Mr. W. Sephton moved, "That this meeting pledges itself to assist the committee of the Prescot Watch Trade Association in preventing the introduction of foreign made movements or any parts thereof into English Hall-marked cases, or otherwise dealing with them in contravention of the Merchandise Marks Act." Mr. James Hall seconded the motion, and said that the working men were determined to fight this battle even though they had to starve in doing so. The resolution was carried unanimously. Mr. W. Ashcroft proposed, "That the Vigilance Committee be formed to discover any infringements that may take place in the Act or take any other steps they may think necessary." He said that the watchmakers had been too long sleeping and allowing their privileges to be filched from them one by one. The Government had given them weapons to fight with, and why did they not use them instead of sitting down quietly? These fraudulent practices were not carried on in broad daylight, but were done secretly and required great vigilance to detect them. The working men wished it to be understood that they intended to be on the alert, and were determined to allow no one to injure their trade. He was informed that these frauds were not about to take place, but were actually going on. Mr. J. Wain seconded the motion. Mr. J. C. Leadbetter, in supporting it, said the watchmaking industry had flourished in Prescot for several hundred years. It now possessed one of the finest factories in the world, and in spite of the efforts of the foreigner and of Coventry to wrest the supremacy from them, the vitality of the trade remained unimpaired. He hoped that they would not now allow their trade to be injured by illegitimate, fraudulent means, but prosecute the foreigner and everyone else who broke the law. He was glad to say that Prescot had grown far more prosperous since the passing of the Merchandise Marks Act. Mr. J. Jackson and Mr. J. Brown also supported the resolution, which was approved. The proceedings closed with a vote of thanks to the chairman.

ROBBERY FROM AN ISLINGTON JEWELLER'S.—William Johnson, aged 23, giving no address, was charged last month at Clerkenwell police-court with breaking the shop window of 252, Upper Street, Islington, and with stealing therefrom a tray containing 25 diamond rings, value £183, the property of Henry Lawrence, jeweller and pawnbroker. Charles Lawrence, assistant to prosecutor, said he was in the shop on Wednesday evening, when he heard a smashing of glass. He rushed out into the street, and found that a large plate of glass in the shop window was broken, and that a tray of rings was missing. Almost directly afterwards the prisoner was brought to the shop by a young man named Sirret, who said he had seen Johnson deliberately break the window with his clenched fist and run off with the tray of rings. The witness Sirret proved pursuing the prisoner and capturing him. Johnson, before he was caught, threw the rings into the gutter. The tray had contained 25 rings, and 20 of them were recovered. The prisoner, who made no defence, was committed for trial.

The Paris Exhibition Awards.

THESE awards have now been officially published, and the percentage of honours awarded to British exhibitors are exceedingly satisfactory, as are also the number and class of the awards obtained by other exhibitors with whom our trades are more or less directly connected or interested. The list of jurors has already been published, but it is not out of place to state here that it is to the untiring energy and devotion of Mr. Tripplin, who represented Great Britain in Class 26, that the proportion of the honours accorded to the British exhibitors in that section is entirely due.

Mr. Victor Kullberg takes the palm, in addition to being decorated with the Cross of the Legion of Honour, obtaining the gold medal, and one silver and one bronze *(collaborateur)* medal.

Messrs. Rotherham and Sons have one gold medal and one silver *(collaborateur)* medal from Mr. William G. Gooding.

Silver Medals have been awarded to the British Horological Institute, Messrs. Gillett and Johnston, and Messrs. Usher and Cole, the first-named institution getting, in addition, three *collaborateur* honours for Professors in the school, and the last two obtaining each two *collaborateur* honours.

Bronze Medals were awarded to the British United Clock Company, E. Dent and Co., Grimshaw and Baxter, Parkinson and Frodsham, and R. G. Webster, while last, but not least, we are glad to see that Mr. Riggs' collaboration in the translation of Saunier's works has been suitably acknowledged by the award of a silver medal.

In the Swiss section, Messrs. Francillon and Co. (The Longines Watch Co.) obtain that much-coveted honour the Grand Prix, while many other familiar names occur in this section with satisfactory honours appended, for which we must refer our readers to the official journal.

Birmingham Exhibition Awards.

THE following is a list of the awards made to the exhibitors at this Exhibition, which closed, after a very successful run of nearly three months, on the 31st ult.:—

First-Class Gold Medals.—*Industrial Section*, Class I.—Henry Jenkins and Son, medals; M. Turnor and Co., pen making; G. and F. E. Wattis, Birmingham, clocks and general exhibit; Wiggin and Co., nickel; Swinden and Sons, Birmingham, non-magnetic watches and general exhibit.

First-Class Silver Medals.—Class II.—General.—Canning and Co., Birmingham, electro-plating; Walder Bros., London, electrical instruments; National Telephone Co., Birmingham, telephonic apparatus; Julius Sax, London, electrical fire alarms. *Industrial Section*, Class I.—Automatic Standard Screw Co., Halifax, screws and terminals; S. Bagnall, Birmingham, safety pin marking; Binney and Son, Birmingham, general exhibits; Britannia Co., Colchester, lathes, &c.; R. Clarke, stamping machinery; Henry Hope, Birmingham, windows and appliances; Harrington and Co., Coventry, tubular bells; Lucigen Light Co., London, Lucigen light; Phœnix Nut and Bolt Co., Birmingham, screws and bolts; Midland Lighting Co., Birmingham, Beige lamp. Class II.—Arup Bros., London, artistic terra cotta; J. Reynolds and Co., Birmingham, surveyors' apparatus and mathematical appliances; E. Wahliss, Vienna, old Vienna China.

First-Class Bronze Medals.—*Electrical Section*, General.—J. E. Hartley and Co., Birmingham, electro-plating; Myatt and Pillinger, electro-plating. *Industrial Section*, Class III.—Benton and Johnson, gold and silver wires and threads; Court, Birmingham, engraving; J. Taylor and Co., Birmingham, pipe mounting.

International Exhibition, Edinburgh, 1890.

IN 1886, the third and greatest of a series of very successful International Exhibitions was held at Edinburgh, and we have now received the prospectus of an Exhibition on a still more extensive scale than any of its predecessors, which is to take place in 1890. The Exhibition, as formerly, is under the patronage of Her Majesty the Queen, and the Marquis of Lothian, Secretary of State for Scotland, is again the president. The vice-presidents include the Lord Provost of Edinburgh, the Lord Provost of Glasgow, the Lord Mayor (elect) of London, Mr. Edison, the great inventor, and Sir John Fowler, the engineer of the Forth Bridge. The chairman of the executive council is Sir Thomas Clark, Bart., ex-Lord Provost of Edinburgh, and of the London committee, Sir George Hayter Chubb. The executive have secured a site of about 90 acres in extent, within easy walking distance of the centre of the city, and possessing the very exceptional advantages of railway stations belonging to the two great Scotch railway lines (the Caledonian and North British) within the grounds, thus enabling passengers from all parts of the kingdom to be set down within the Exhibition enclosure. Tramway lines also run to the entrances, and a canal, to be utilised for the conveyance of visitors, skirts the grounds. The extent of the grounds will enable ample space to be devoted to outdoor and indoor entertainments of all kinds, and the utmost attention will be given to this essential part of the undertaking. It is anticipated that the opening of the Forth Bridge, the greatest engineering work in the world, early in 1890 will attract numerous visitors, and these, added to to the great stream of tourists, etc., which annually visit Edinburgh, will, no doubt, ensure a success still greater than that achieved in 1886. The Exhibition will include electrical engineering, general inventions, industries, and fine arts. It is proposed to close the list of applications on Dec. 1, 1889, the space at the disposal of the council being already very largely applied for. A great number of the most interesting exhibits now at Paris will be shown at Edinburgh, including samples of the extensive and unique collection of Mr. Edison, who also shows his interest in the Exhibition as one of the vice-presidents. Exhibitors will appreciate the facilities which will be afforded them, probably for the first time in the history of Exhibitions, of having their exhibits conveyed by rail direct within the Exhibition grounds. The classification comprises 22 sections, 6 being devoted to electrical engineering and inventions, and 14 to general inventions and industries, with special sections for women's and artisans' industries. There is also a separate section for fine arts. The general manager is Mr. Lee Bapty, whose name is a guarantee for efficient management and attention to the interests of exhibitors.

The Clockmakers' Company Banquet.

THE members of this Company dined together on the 7th ulto., at the Albion, Aldersgate Street, Mr. Alderman Savory (the master) in the chair. The guests included:—

The Rev. H. L. Nelthropp (junior warden), Mr. E. W. Dubois, Mr. Deputy Atkins (senior warden), Mr. Deputy Hora, Major Leach, R.A., Mr. H. Pemberton Leach, Mr. E. F. Jenkins (chairman of the Library Committee), Mr. C. Rowlands, Mr. D. Clarke (renter warden), Captain Tuit, Mr. G. W. Adams, Colonel Stebbing, Mr. W. Lawley, Mr. T. L. Hands, Colonel Campbell, Mr. Saul Isaac, Mr. T. Read, Mr. G. T. Adams, Mr. H. J. Adams, Mr. G. H. Boyce, Mr. M. Boyce, Mr. H. S. Foster, L.C.C., Mr. W. D. Cronin, Mr. Joyce Murray, Mr. J. W. Carter, Mr. I. Menzies, Mr. J. W. Abbott, Mr. F. W. Nash, Mr. H. Wilson, Mr. W. Barnsdale, Mr. F. B. Adams, Mr. I. Scovell Adams, jun., Mr.

C. T. Harris, C.C., Mr. G. W. Atkins, Mr. Hyde Clarke, Mr. W. Grogan, Mr. C. E. Wellborne, Mr. W. H. S. Gilbert, Mr. L. Donne, Mr. A. Sarle, Mr. G. Moore, Mr. W. Davies, Mr. E. J. Thompson, Mr. J. Fenn, Mr. C. E Atkins, Mr. A. W. Rowlands, Mr. A. Rowlands, Mr. P. Woodman, Mr. I. Woodman, Mr. C. Welch, and Mr. H. C. Overall (the clerk).

After the usual loyal and patriotic toasts, which were suitably responded to, Mr. Deputy Hora gave the toast of "The Master," observing that as he was not a clockmaker he could not say how the Master had performed the duties, but he knew him in his capacity as a member of the Corporation, and had seen with what great assiduity and much talent he did the work devolving upon him. He was sure they would all be delighted to see the Master installed into the highest and proudest civic office, which would, he had no doubt, occur next year.

In responding, the Master explained that while he was Sheriff several members of that Company extended much warmth to him, and as a result he became a member, but he did not know that he would so soon become the Master of the Company. If he were called upon to fill the high office of Lord Mayor next year, it would be his earnest endeavour to follow in the footsteps of the men who had preceded him, and he should then need the support amongst others, of his friends the members of the Clockworkers' company. No Lord Mayor could fill that important position without feeling he could rely for support and counsel upon those who had been his friends—the friends of his youthful manhood. The position of the Master of the Clockmakers' Company was by no means an unimportant one. There were many guilds of the City whose *raison d'etre* had passed away, because the trades with which they were associated had ceased to exist. That was by no means the case with the Clockmakers' Company. Their scientific craft had made rapid strides within the present generation. Life passed very rapidly away, and they should endeavour not to waste a single minute. They had a museum, and they gave prizes to those who developed an interest in the manufacture of watches. Further, they provided for the decayed members of the craft. They were anxious that no one connected by relationship with a member of the Company should in his old age suffer from want or privation. By pensions and almshouses they endeavoured to comfort and solace them in the hour of need. He concluded by giving "The Visitors."

Mr. C. Rowlands responded.

In giving "The Past Masters of the Company," the Master referred to the fact that he was fortunate in having a good many Past Masters. In the management of the affairs of a Company like that he was glad to be able to apply to them for advice and assistance. Amongst the Past Masters he could mention were Mr. Adams, whose name represented three generations in the Company, the eldest of whom was present. They had also a distinguished member of that Company in Mr. Deputy Atkins, who had been associated with the Company for many years, and had seen it in its adversity.

Mr. Past Master G. Adams responded shortly, observing that when he joined the Company 60 years ago, they were only able to give a livery dinner once in three years.

"The Wardens" was next given by the Master, who remarked they were excellent aids in discharge of the duties of Master. He gave the toast with much heartiness and enthusiasm.

Mr. Deputy Atkins, as senior warden, responded on behalf of himself and his colleagues, the renter and junior warden, stating that it had always been their endeavour to perform the duties in a manner satisfactory to the members of the Company.

The next toast was that of "The Livery," which was responded to by Mr. Harry S. Foster, L.C.C., M.L.S.B., who was the youngest member of that body, having been admitted that day. He referred to the work the County Council had done since its formation, and said that while some of its proceedings might not meet with the entire approval of every one, matters would go much better when affairs got into thorough working order. He was proud of his connection with the company.

"The Clerk" was the last toast, to which Mr. Overall responded in fitting terms.

Alleged Fraud on a Bond Street Jeweller.

AT the Marlborough Street Police Court, on October 9, Louis John Islip, giving an address in West Cromwell Road, and describing himself as a retired captain of engineers, was charged with obtaining by false pretences a cruet-frame, eight silver-mounted bottles, and twelve silver teaspoons, the property of Mr. George William Smith, jeweller, of Old Bond Street. The prosecutor said that the prisoner, a stranger, entered his shop on the 20th of July, and asked to be shown a cruet frame then in the window. It was placed before him, and he asked the price for cash. He told him that although the frame was marked £20, he would accept £15 cash for it. The prisoner agreed to buy it, and promised to pay that sum on its being delivered at his residence in the West Cromwell Road. Afterwards he asked to see some silver teaspoons, saying that he wanted a dozen. He selected a beaded pattern, of which the prosecutor had only half a dozen in stock; but, on the price being satisfactory, he promised to get him six more, so as to make up the number required. These goods, as well as others, were taken by the prosecutor's son to the address named, and he was told that Mr. Islip was not at home, but that it would be all right. He left the articles with the housekeeper without bringing back the money. Subsequently the prosecutor saw the accused at the house, and then he handed him a £10 cheque, post-dated, in part payment. It was sent into the bank, but returned marked "Account closed." Civil proceedings were taken to obtain the amount, and judgment was obtained; and then it was discovered that the articles had been pawned. Cross-examined by the prisoner, the prosecutor said that he did not try to extort the cheque from him, saying that his father had ordered him not to return without the money. He had no father, in fact, and therefore it could not have happened. He had no recollection of being told by the prisoner not to pay in the cheque, it being post-dated, until he had communicated with him. He received a letter from him from Goodwood asking him not to pay the cheque in. He saw the prisoner last Tuesday night after the warrant had been issued and asked him for the money; but he did not tell him that he had a detective outside with a warrant, and that he would be apprehended unless he paid over the £27. When he found he could not obtain any cash the detective was brought in and he was taken into custody. In re-examination the prosecutor said that he went to the prisoner's house on Tuesday night considerably in advance of the officer with the warrant, and he purposely kept the accused in conversation till he arrived. Detective-Sergeant Scott said that at about seven o'clock on Tuesday night he went to 172, Finborough Road, Brompton. Mr. Smith opened the door, and witness found the prisoner at tea. He told him the charge, whereupon he exclaimed, "I am surprised. If a summons had been issued I should not have run away. This is a civil action, and the warrant has been obtained by falsehood and false pretences." A pawnbroker's assistant produced six teaspoons, pledged on the 27th of July for £1; six other spoons on the 6th of September, for £1; and a cruet stand, pledged on the 30th of September, for £7, each lot by the prisoner, under the name of Mr. J. Fox. The cruet stand has been previously pawned and redeemed, but the assistant was unable to give the date. Mr. Newton ordered the police to make full inquiry into the prisoner's antecedents, and ordered him to find a surety in £100, if released, to reappear in answer to the charge.

Artificial Gems.—Quite a valuable novelty, says a contemporary, are the artificial gems made by Dauphin, of Geneva, for inlaying or mounting in enamel. They are made of a leaf of gold, silver, or platinum, shaped and polished in such a way that its concavity has the appearance of a finely-cut brilliant. This hollow is then filled with a drop of transparent enamel of the colour desired, and the effect is marvellously like that of a handsome gem. They are very cheap, costing about a shilling a hundred, and can be mounted by anyone.

French Industrial Art at the Paris Exhibition.

Jewellery and Gold and Silversmith's Work.

THE following is the first of a series of interesting articles on the jewellery and kindred exhibits at the Paris Exhibition, by a correspondent of the *Pall Mall Gazette:*—In the little cases of the jewellery department of the French Section of the Exhibition at Paris—each one of which is a "thing of beauty" simply from the point of view of arrangement—there are to be found works of art and masterpieces of the jeweller's skill which one may go as far as the royal collections at Dresden before seeing equalled. Of jewels—diamonds from the purest white through all the shades of yellow and bistre to black; of pearls matchless in perfection of form and variety of colour; of opals, rubies, and emeralds—there is a collection such as the world has never seen before, and which apart from their immense value, are notable chiefly for the taste with which they are set and mounted. But that which is far more interesting than the jewels are the specimens of the goldsmiths' and enamellers' work, which show that the industrial arts of the 15th century still linger among us and that they are cherished more particularly by the French. Often on mere trifles—a snuff-box, a pince-nez, or a scent-bottle—art and skill have been lavishly expended. Thus, we note eye-glasses with a long handle of cerulean blue enamel encrusted with diamonds in a Louis XV. design (Th. Bourdier); a small crystal vase, six inches high, with the base grasped by four sitting or kneeling Cupids, delicately modelled in silver, and on the vase have settled here and there a gold and enamelled-winged fly (Vever). In the cases of Messrs. Bapst and Folize are, perhaps, to be found the finest work, as well as the most varied examples of the craftsman's art. Here the enamels are unique, whether the pendants of figures of Cupids or nymphs in the Renaissance style be considered or the transparent enamels on engraved silver. Of the latter the most splendid example—a carved crystal vase set with plaques of enamel de Bassetaille and cloisonné—has been purchased by a well-known English collector. In France the jeweller is not a mere setter and seller of jewels, but also an artist in precious metals in the broadest sense; and the fine statuettes and groups in pale greenish gold and in silver, particularly those of Pleasure and Labour, exhibited by the same firm, are an evidence of this fact, as well as a delightful little figure in bronze of a monk reading, executed by Cordonnier in the *cire perdue* method. Dominating the jewels and trinkets is a bust of Gallia, the face in ivory finely conceived and carved; she wears on the head a chased gold helmet surmounted by a dragon. The bust is covered by silver chain armour encrusted with a Medusa's head in gold repoussé; on the shoulders are epaulettes of gold tigers' heads with gleaming emerald eyes. Debut and Coulon exhibit examples of pierced ironwork enriched with gold, and encrustation of gold and silver figures on iron, of extraordinary minuteness and delicacy. Charming and novel combinations—such as encrustations of diamonds on leather or illuminated vellum in card cases and the bindings of prayer books, repoussé silver figures on aventurine, encrustations of precious stones on crystal or enamels—these are to be seen in many exhibits; as well as dainty conceits—such as a letter weight of marble, bearing a snail, with a body of pearl and horns of diamonds, and lace of platinum net set with diamond flowers, exquisite combinations of enamels and precious stones in bracelets and tiaras, and the finest examples of repoussé and niello work in objects of female adornment or in *articles de toilette* or *de luxe*. All these abound; and no two articles are to be found alike in design, while each is a model of technical skill and artistic design. The whole exhibit is one which cannot but be viewed with amazement, whether on account of its wealth, or the higher standard of artistic skill attained, and it is one which no other nation in the world could produce.

From the jewellery we pass to the *orfevrerie*. Here the present fashionable taste for the rococo style of Louis XV. is painfully apparent. The meaningless curves of this style of decoration represented in candelabra and dessert services have for us no attraction, any more than the ordinary Gothic replicas of reliquaries; but leaving these altogether on one side, we find much in this department to admire. First we may notice the series of silver statuettes awarded by the Agricultural Society of France to successful competitors for prizes. The figures, by Gautheim, Cantan, and other artists, represent labourers engaged in the ordinary avocations of country life—raking, sowing, feeding the pigs, etc.; but with such Millet-like grace and realism that they are delightful works of art. It would hardly occur to any other nation less artistic than the French to give awards so charming for achievements so mundane. The most splendid examples of the goldsmith's art are to be found in the exhibit of Messrs. Armand-Calliat, of Lyons; whose reliquaries, croziers, and chalices are to be found in most of the great Catholic cathedrals and churches of Europe and the East. Many of these have been collected and lent for exhibition. Striking out a new and original line for themselves, and yet retaining all that is best of the early Gothic and Byzantine, MM. Armand have produced masterpieces, which naturally find their home in Catholic countries.

Aiming at originality also, M. Christofle exhibits some printings of actual flowers and leaves on metal plaques, which printings afterward receive different-coloured patinas. Fine cloisonné enamels are here shown, as well as pieces damascened and encrusted with different-coloured metals in the Japanese manner, and with an equal fidelity to nature, and a greater knowledge of art. The exhibit of M. and Mdme. Brateau must not be omitted, as it illustrates one of the most delightful phases of French industrial art—*i.e.*, individualism and association in the artistic workshop. M. and Mdme. Brateau have revived the old art of repoussé in tin, which is a metal that yields more readily to the artist's will than silver or steel. Madame draws the decorative part of the design and M. Brateau the figures, and he also works the metal into forms as lovely as any seen even in an exhibition full of lovely things. Mdme. Brateau is to be found beside the case, willing to give information, and to sell her *objets d'art*—an artist, a lady, and a workwoman, a typical product of a nation of artist-workmen."

The Watchmaker and the Water Company.—At the Westminster Police Court, Mr. Ebenezer Botting, watchmaker, No. 18, Brompton Road, accompanied by his next-door neighbour, attended last month before Mr. Shiel and complained of the action of the Chelsea Water Company in cutting off their water supply without any previous notification, although they held receipts for the rate due at Midsummer. It appeared that a tradesman two doors away was in difficulties, and his water rate was in arrear. The service of water to his house was in connexion with the services to applicants', and consequently all three suffered for the default of one. Mr. Shiel: What do the water company say to your complaint? The watchmaker said that they could obtain no redress, and were told that they ought to have separate supplies. He did not see why he should be called upon to go to the expense of making an alteration in the pipes, for during thirteen years, for which period he had been a tenant of the house, and no doubt for years before, the same system had prevailed. Mr. Shiel: The company have a right to cut off the water supply to the defaulter, and if in doing so they necessarily cut off yours I do not see how I can interfere with them. Applicant: Well, it is a very serious thing, and a high-handed proceeding. We have had no water since last Wednesday, and yet we owe nothing. More particularly we complain of the fact that we never had the least intimation of the intention of the company to cut off the supply, and we are told that before it will be put on again all the expenses and arrears must be paid. Mr. Shiel told the applicants he could not grant a summons on the facts disclosed and advised them to go to the water company again. Applicant said that was useless. They treated everybody with the same inconsiderateness, and said they had power in their Acts of Parliament to do practically what they liked.

Half-hours with our Manufacturers.

V.

As the new Birmingham branch office of the *Watchmaker, Jeweller, and Silversmith* is located on their premises, we thought the present a good opportunity of going over the manufactory of

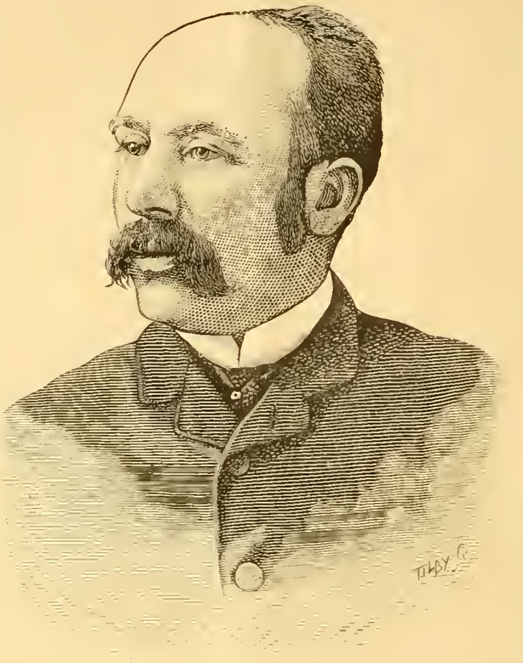
Messrs. Lucas Bros.

in the spare intervals of furnishing and fitting up, believing also that the manufacture which they make a speciality of, namely, that of gold and silver pencil cases, would be of sufficient interest to our readers to entitle a short description of some of its processes to a place in our series of "Half-hours with our Manufacturers."

Messrs. Lucas's works are situated at 22, Hylton Street, in the centre of the Birmingham jewellery trade, with which quarter the firm have been identified for the past 25 years, and like many other of the now prominent, and if we may be allowed to use an American expression, "live" houses they have advanced to their present importance by their *vis animi* in noting the wants of fashions and markets, and quietly but quickly anticipating them.

The premises comprise three floors made up of well-lighted and airy workshops, warehouse and offices, and are capable of accommodating some 150 workpeople. Lifts and speaking tubes for facilitating intercourse and the exchange of goods run through the various floors, and a telephone in the principal office affords ready communication with all connected with the Midland circuit.

A further extension of this Midland telephone system, it may here be incidentally noted, which has long been projected, is now on the way to be carried out, and we may expect that the Birmingham and London systems will be shortly connected; London buyers will then be able to constantly communicate directly with the Birmingham manufacturers, which will obviously fill a "long-felt want," and lend, it is to be hoped, an additional spur to the trade of both places.



EDWARD LUCAS.

Going over the factory with the principal, who was at great pains to show us even the most secret processes in the manufacture of the pencils (for Messrs. Lucas claim to have many plans and contrivances in machinery, especially for making the internal parts of the cases, which are unknown to other makers), we were much struck by the extent of the machinery employed, and the number and ingenuity of many of the machine tools used for making such an apparently simple article as a propelling pencil. The importance of a methodical system of production, and the use of labour-saving appliances, wherever such are admissible will, however, be readily understood, when it is said that by such means, the cost of producing some of the internal parts has been reduced from 24s. to 12s. per gross in the same workman's hands, other pieces being proportionately reduced, and this without any cutting down of wages—in fact, the man who is now paid about half the former prices for the same work, earns considerably more money than could possibly be earned under old systems.

Under present conditions of trade competition, with manufacturers ever ready to appropriate the ideas of others, it was not to be expected that Messrs. Lucas would be willing to let us see everything they were doing, without putting considerable reservations upon us with regard to communicating the same to our readers, so as a matter of fact this paper goes to press with more "deles" than "stets" against many of the pars.

Proceeding in the order in which the cases are manufactured, the first process consists in drawing the outer tubes. For this purpose a powerful draw-bench with multiplying power gearing is used. This bench is, like most of the appliances we saw, of special design, and the manner in which the chain goes over the drum, coupled with the power gearing above-mentioned, enables the tubes to be drawn perfectly straight, instead of in the usual diagonal manner, thus ensuring a smooth action in the finished pencil, obviously a point of primary importance in its construction.

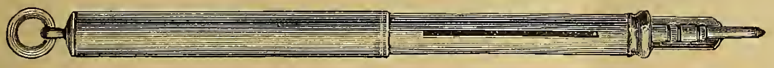
The tubes are drawn from flat slips, cut off the sheet metal by circular shears, through a draw-plate on a steel rod, which forms a round tube. After this they are soldered, and if any further fancy shape is required, they are drawn on brass rods through other plates to the desired pattern; Messrs. Lucas make a great speciality of these fancy patterns, of which they have an immense assortment. Twists are formed by an ingenious arrangement of draw-plates, which act automatically, the plates being really short screw-plates, which rotate on anti-friction bearings, twisting the tube as it is drawn through them.

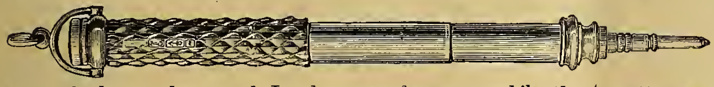
The mounts are drawn from solid blanks in the press, instead, of by the old process of turning up, swaging, and soldering which produces sounder work, while at the same time greatly economising labour; the whole of this work, which formerly required the employment of skilled labour, being done with ease by girls.

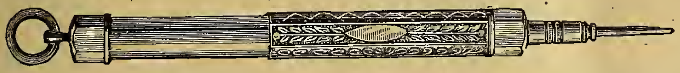
What is technically termed the "action," begins with the "motion," or point which holds and propels the lead. The best "motions," for the more expensive cases, are made by hand, the silver or gold parts being all turned in a lathe, the mandrel of which is made to turn backward or forward at will by an apt contrivance of pulleys and bands. Common "motions" are formed in tools in special presses, the latter being also operated by girls.

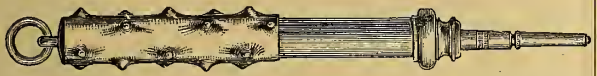
The "action" which propels the point consists of one or more spirals, according to whether the pencil is of the ordinary twist-out or "magic" description. Messrs. Lucas have a very thorough and expeditious method of forming these spirals, the process being entirely self-acting; the strips of metal are wound upon a steel rod in a modified kind of screw-cutting lathe, the spirals thus formed with the slot in them are as near perfection as possible, being perfectly true, and the number of turns to the inch (what a screw maker would call the "pitch") can be regulated with the greatest certainty by means of the gearing attachments. These spirals, which are made in long lengths, are afterwards cut into the lengths required for different sized pencil cases.

The finishing processes comprise: pinning up, putting together the various parts, soldering, engraving, chasing, &c., and polishing. These are all done by skilled workmen. As may be judged from the few cuts which we have been able to reproduce, an infinite variety of chaste patterns, new designs, and complicated pieces, are continually being produced in this pencil manufacturing industry, and a look through the stock of one of the principal Birmingham producers in this line of specialities, would be to many of our London friends, as they have been to us, a revelation, both in regard to the prices quoted and the quality and finish of the work turned out by the latest and most improved methods of production. In the latter respect we can safely say that the work we inspected is quite equal to that of some of the much-vaunted London manufacturers, while the former can only be accounted for by the economy which results from the employment of special machine tools, in every conceivable manner, for lessening the amount of skilled labour and facilitating production, coupled with a perfected system for reducing all waste of energy and material to a minimum.

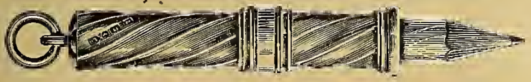


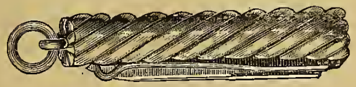






In addition to their pencil cases, Messrs. Lucas Bros. manufacture every variety of jewellery for personal adornment, many of the designs in which, especially some brooches, &c., in the new moonstone and pearl jewellery, struck us as being exceedingly tasteful and original. The illustrations of pencil cases shown are taken from the catalogue of the firm, which, they inform us, they will be pleased to forward on application being made to them to that effect. The portrait is that of the head of the firm, Mr. Edward Lucas.





The Silver Trade of Sheffield.

A GENERAL meeting of the proprietors of the Sheffield Literary and Philosophical Society was held at the School of Art, Arundel Street, last evening, when Mr. Arnold T. Watson, the president, read a paper entitled "The Sheffield Assay Office, with a few Notes on the Silver Trade of the Town." Mr. J. D. Leader occupied the chair.

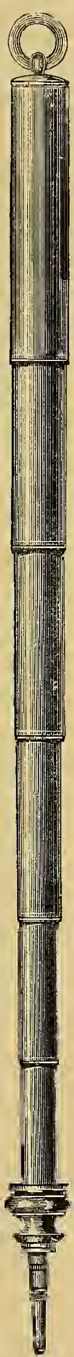
In commencing his paper, Mr. Watson in the first place explained that the precious metals silver and gold were too soft to bear the wear of every-day usage, and that consequently a certain amount of alloy was added to impart the necessary hardness. He then briefly glanced at the Acts which have been passed from time to time, commencing with the time of Edward I., when the standard for silver was fixed at the quality of money, that of gold being the "touch of Paris," which is equal to 19 1-5 carats. In subsequent reigns the quality of money having varied very considerably—being as poor in the reign of Edward VI. as only one-fourth part of silver—in the reign of Elizabeth the present standard of 11ozs. 2dwts. was fixed. In the reign of William III. it was found, or supposed, that the silver coin was being melted up to be converted into vessels, and consequently the higher standard, which was subsequently known as "Britannia" silver, 11ozs. 10dwts. was introduced, but articles made of it were found to be too soft, and therefore in the year 1719 the old standard of 11ozs. 2dwts. was restored, Britannia silver still being legalised. The duty of enforcing the Acts was at first entrusted to London alone, subsequently offices were established at York, Newcastle, Lincoln, Norwich, Bristol, Salisbury, Coventry, Exeter, and Chester. Until their establishment, goldsmiths and silversmiths had to send a representative to London to have their wares tested and marked, and this was the position of matters as regards Sheffield previous to the establishment of the Sheffield office.

The Rise of the Silver Trade.

Exactly what circumstances gave rise to the silver trade of the town must be more or less a matter of speculation, but probably it may be regarded as the offspring of the cutlery trade, as it arose from the discovery made by Thomas Bolsover, a Sheffield mechanic, and a member of the Cutlers' Company, who in 1742, whilst mending a knife which was partly copper and partly silver, accidentally fused the two metals, and from this circumstance saw the possibility of a process for coating copper with a silver covering. This invention was the starting point of a very important trade in plated wares. Bolsover himself only applied the process to the making of such small things as buckles and buttons at a manufactory at Baker's Hill, but subsequently Joseph Hancock, who had been Bolsover's apprentice, improved upon his master's invention, and utilised the process in the manufacture of larger articles, making first a saucepan silvered inside, afterwards tankards, coffee pots, and in fact, almost everything that had been previously made in silver was made of what was then known as "Sheffield plate," and which for a century held its own in every market. On the introduction of Bolsover's process very great difficulty was experienced in obtaining suitable workmen, and Bolsover and those who followed him had to avail themselves of the services of itinerant tinkers and such men as they were able to induce to come from London, York, and elsewhere. Many of these men were very disreputable characters, and soon found that they had their employers at their mercy. It was no uncommon thing for them to demand from £50 to £100 to support themselves whilst they went "off on the spree," and one instance has been given of a party of seven braziers who had been "boozing" for a week upon money advanced by their masters, sending two of their number for a further £10 each, to be added to their debt, on which condition only they would promise to return the following week. Some of these men kept hunters, and several had the hairdresser to attend them at their respective manufactories in working hours.

A Better State of Affairs.

By degrees a better state of affairs began to prevail owing to occasional depression in trade. The masters had then opportunities of discarding the inferior workmen and those of confirmed irregular habits, and the difficulty experienced by persons of moderate means in finding employment for their sons induced them to apprentice them to the trade, which thus passed into the hands of a better educated and superior class of men. For the first 60 years after Bolsover's discovery it was regarded as possible only to plate copper on one side, but it was subsequently found possible to do it on both sides. Out of the trade in Sheffield plate, no doubt combined business would arise; manufacturers would see openings for supplying their customers with silver articles, and thus probably the trade in silver goods would be introduced, and the manufac-



turers would feel the hardship of being so far from an assay office. The silver trade probably originated in Sheffield between 1742—1773, for in 1773 a petition was presented to the House of Commons by silversmiths of Sheffield and neighbourhood complaining of their disadvantageous position in having to send all their goods to London for assay. On the following day Birmingham also petitioned. These applications were of course regarded with disfavour by London, and the goldsmiths of that city petitioned against the proposed Bill. Upon this followed an inquiry into the manner of conducting the assay offices which were existing at that time, and also into certain frauds and abuses which are said to have been committed by manufacturers of gold and silver wares. The London goldsmiths presented a petition alleging that frauds and abuses had been committed by the goldsmiths and silversmiths of Birmingham and Sheffield, and the whole matter was inquired into before the committee appointed. The result of this inquiry went to show that although there might have been some irregular transactions on the part of the Birmingham and Sheffield manufacturers, still they were far outweighed by

The Irregularities of the London Men Themselves.

Amongst other things it was shown that the London Hall was passing silver which was from 1½dwts. to 1 oz. 16dwts. worse than standard, whilst there was no evidence to show that there was any fraudulent intent on the part of the Sheffield manufacturers. The result of the inquiry was that the Sheffield and Birmingham Assay Offices were established upon a very much more complete and satisfactory basis than the then existing halls, as all the weak points which were disclosed during the inquiry were carefully guarded against in the Sheffield and Birmingham Act. In April, 1773, seven Sheffield and fourteen Birmingham firms of silversmiths had their marks entered at Goldsmiths' Hall, the parties all being alive at that time. The Sheffield and Birmingham manufacturers having been successful in their petition, and having obtained the desired Act, the Marquis of Rockingham, the Earl of Strafford, and the Earl of Effingham, with 27 other gentlemen, were appointed the first board of guardians of the Sheffield Office, and they held their first meeting on July 5, 1773. It took place at "the sign of the George," there being seventeen guardians present besides the Earl of Effingham, who presided. Mr. Gilbert Dixon was appointed the first law clerk, and Messrs. Joseph Hancock, John Rowbotham, Simon Andrew Younge, and Samuel Staniforth were made wardens of the company. Mr. Daniel Bradbury, of London, was appointed the assayer.

Assay Master and Wardens.

Mr. Watson then briefly glanced at the provisions of the Act, referring especially to the regulation as regards the check of the Mint upon the quality of the silver passed at these halls. He explained that a certain portion of the samples of all articles passed at the Sheffield and Birmingham offices was required to be sent up annually to the Mint to be tested by the Queen's Assay Master to ascertain that the quality was equal to that of the standard plate or better, and he said he considered this provision a most important one, and that it was very desirable that all the offices should be subjected to this independent check. At the present time Sheffield and Birmingham only are compelled to submit, but Chester this year voluntarily sent its "diet" also for examination. In this act the charge for marking is fixed at 1s. per lb. troy; at the present time the charge of the office is only half this scale excepting for very light articles. Both the Assay Master and the Wardens are under oath for the faithful discharge of their duties. The office was at the time named open two days per week, the date letter for the year being an old text capital letter E. At an adjournment of the first meeting of the Guardians, Mr. Henry Tudor and Mr. John Winter were authorised to contract in their own names for "that dwelling-house in Norfolk Street, in Sheffield, wherein Mrs. Eleanor Green, deceased, lately dwelt," to be used as an Assay Office. The house taken was situated in a yard in Norfolk Street, the yearly rent being ten guineas. The office was open for work on September 20, 1773. The entries appearing in the books on that day are:—Tudor and Leader, one goblet new sterling, one chased cup old sterling; Fenton, Creswick, and Co., thirteen pairs candlesticks. Scarcely had the offices at Birmingham and Sheffield got to work before they found that they were handicapped by their Act, as compared with London, since their Act required them to make their silver goods of the exact standard, 11ozs. 2dwts., or better; but it was discovered that in spite of the recommendation of the Parliamentary Committee of April, 1773, London was still passing goods from 2½dwts. to 7dwts. below standard, and the members for Yorkshire and Warwickshire were requested to take steps for introducing a Bill to redress the grievances complained of. Such a committee was, the writer believed, appointed, but no legislation seems to have resulted. The funds of the Sheffield office were very low, and the guardians naturally shrank from incurring any very great expense. Still there is no doubt that the inquiry and agitation had a considerable effect in bringing about the better state of things now prevailing. For the first eleven years of its existence the Sheffield Guardians struggled vainly to make ends meet, and ultimately in July, 1784, went to Parliament for powers to charge an increased rate on small articles. This Act they obtained, but in it they also got a clause which was very important as bearing upon the silver plate trade of the time. By the Sheffield Act manufacturers were under a penalty of £100 if they placed any letter or letters upon an article plated with silver, and consequently they were afraid to strike even their own names upon them. Under the new Act, makers of such goods residing in Sheffield, or within 100 miles of it, were empowered to register a mark for their plated goods at the Sheffield office, such mark to be their names in full, accompanied by a device to be struck with one punch only. These marks must have been a great disfigurement to any article. Birmingham falling within the radius of this Act, the platers of that town were compelled to register their marks here, and this was felt to be a very great grievance, and was avoided as far as possible, the result being that Sheffield obtained some considerable sums from Birmingham in the form of fines. This clause seems to have been in full operation until 1824, when the Birmingham office went to Parliament for a fresh Act, and in this Bill they had included a clause enabling them to register marks of platers residing within their town or a certain radius of it. The clause was very strongly opposed by the Sheffield Guardians, and ultimately was withdrawn, it being understood that the Government intended to pass an Act consolidating the then existing Acts, and that they would deal therein with the question of marks to be used. No such Act, however, appears to have been passed. The platers appear to have considered themselves to have been absolved from further observation of the Sheffield enactment, as no Birmingham mark is registered after that date, and only four Sheffield ones within the next twelve years, after which no plater's mark is registered. During the time the Act was in full operation, 77 Birmingham, 1 London, and 51 Sheffield platers' marks were entered in the register.

The Progress of the Sheffield Office.

From the date of the passing of the second Act, the Sheffield office gradually got free from its financial difficulties, and in 1793 found itself in a position to build an office. They purchased some leasehold property in Fargate, in the occupation of Nat Osbourn, from Mr. Edward Shepherd; this property they pulled down, and upon the site built the substantial brick dwelling-house and office, which all will remember as the old Assay Office. This was built by Messrs. Senior and Drury, from plans prepared by Joseph Badger and Son, of Brinsworth Orchard, the cost being about £900. The freehold of the property was subsequently brought from the Duke of Norfolk. The business began to be carried on at the new offices about June or September, 1795. In 1819 the guardiaus of the office felt themselves justified in reducing the charge for marking by 25 per cent., and this continued until 1832, when they fouud it necessary to again return to the old scale. This was a matter much to be regretted, inasmuch as up to that date the guardians had, after the annual meeting, always adjourned to the Angel or Tontine, where they dined together; after this date this annual dinner seems to have been discontinued. The depression appears to have lasted until

1843, and that year is notable not only as the termination of bad times, but also because within it electro-plating was first commenced as a business in Sheffield. Three years previously, Mr. John Wright, a surgeon, of Birmingham, discovered the use of cyanide of potassium for the use of electro-plating, and sold his invention to Elkington, of that town, who obtained a patent for the process. Mr. John Harrison obtained a licence from them for the use of the process in this town, and engaged Mr. George Walker as his operative plater, sending him to Messrs. Elkington's works to be instructed in the process. On July 1, 1843, he advertised that he had commenced the business of electro-plating under Elkington's patent. Mr. Walker remained in Mr. Harrison's service only about eighteen months, and in 1845 commenced business on his own account as an electro-plater, he being the founder of the present firm of Messrs. Walker and Hall. It will be noticed that

This was Exactly 100 Years after the Introduction

of Sheffield plate; and the new process was destined to become a successful rival. It has sometimes been said that electro-plate has interfered with the silver trade of the town, but the books of the office show no sign of this. From about the year 1819 to 1843 the weight of silver sent for assay was on the decline, but from the latter date it has been gradually increasing, the weight last year being more than four times the amount marked in 1843, and this, notwithstanding the fact that since 1854, Sheffield manufacturers have been free to send their goods to London and elsewhere, and have unfortunately availed themselves of that power to a large extent. A diagram was exhibited, showing the fluctuations in the weight of silver marked at the office from its commencement up to the present time, which was exceedingly interesting and instructive. It was seen from this that as regards the Sheffield office the imposition of the duty seemed to have produced practically no effect upon the silver trade of the town, a rise in the quantity marked being shown occasionally, even in the year following the imposition of the duty. During the 116 years the office has been in existence, eight persons have held the position of Assay Master, viz.: Daniel Bradbury, 16 years; George Dickinson, 18 years; Samuel Hancock, 2 years, Matthew Sayle, $24\frac{1}{4}$ years; Lewis Charles Sayles, 21 years alone, and 15 years jointly with his father; John Watson, 24 years; W. H. Watson, 11 years jointly with Arnold T. Watson and 10 years jointly with his late father. The guardians have also had the services of five law clerks: Gilbert Dixon, 11 years; Mark Shelton, $41\frac{1}{2}$ years; John Watson, 24 years; Henry Edmund Watson, $31\frac{1}{2}$ years; and W. B. Esam, the present law clerk, 8 years. In 1784 the duty on silver plate was restored, and to the Assay officers was entrusted the responsibility of collecting it. The law clerks of the office since that date have held the combined offices of law clerk and accomptant, or receiver of duties. Upon the list of guardians prepared from the minute books there are 179 names. Amongst those who have taken a most active part in guiding the affairs of the office comes the name of the Earl of Effingham, who presided at the first seven annual meetings of guardians, evidently taking a very deep interest in the welfare of the office. His successor, Richard, was an almost constant attendant at the meetings. He was present at seventeen in succession, and was chairman at fifteen of them. The Earls of Wharncliffe and and Fitzwilliam also on several occasions attended the meetings, and the Vicars of Sheffield, James Wilkinson, Thomas Sutton, and Thomas Sale, also took an active part in the management.

The Date Letter on Silver.

Attention has often been called to the irregularity of the practice of the Sheffield office as regards the date letter, all other offices commencing these with the first letter of the alphabet, and running through regularly with certain omissions, but the Sheffield guardians at the establishment of the office, adopted a plan of their own. The first cycle, commencing 1773, had for the first letter an old text capital letter E, followed by F, and then N and other letters irregularly. The second cycle commences July, 1799, with a Roman capital letter E, followed by N and other letters irregularly. During the writing of the paper it occurred to Mr. Watson that probably the explanation of this irregularity is that the letter E was adopted out of compliment to the Earls of Effingham, who had done so much for the office. Thomas, Earl of Effingham, was in the chair when the first cycle was decided upon, Richard, his successor, occupied that position when the second cycle commenced. The third and succeeding cycles from 1824 commence with the letter A, and continue regularly through the alphabet, and it is to be noticed that the Effingham connection with the office appears to have ceased in 1816, the irregularities ceasing almost simultaneously, which appears like a confirmation of the idea. The present date letter of the office is an Egyptian capital letter W. The present honorary wardens are Messrs. Thomas Bradbury and Austin Nicholson, the acting Wardens being Messrs. John Newton and Alfred Nicholson. The other guardians representing the silversmiths of the town are Messrs. Ebenezer Hall, Charles Favell, J. W. Dixon, E. T. Atkin, Herbert Hutton, Charles Belk, and William Chesterman. These gentlemen take a very active part in the management of the affairs of the office, and their high standing and well-known business ability is a guarantee to the trade on the one hand that their interests will be well watched, and to the community on the other hand that their interests will be fully protected. Upon the list of guardians of the office there are also several influential townsmen, such as Sir Henry Watson, Sir John Brown, Sir Henry Stephenson, Messrs. M. J. Ellison, James Henry Barber, and others.

The Appliances used in Assaying.

Mr. Watson then described the changes which had taken place in the appliances used at the office, and showed one of their splendid Assay balances by the side of one of the balances used by the first Assay masters. He stated that in 1867 the method of heating the furnaces by charcoal was superseded by a gas furnace of his own design and construction. The guardians and their officers gladly avail themselves of the most approved methods, and willingly consider any suggestions which are made. One such is that they should revert to the touch stone, but they cannot see their way to act upon it, as the method is an exceedingly antiquated one, and has long been abandoned by the older officers as unreliable. This is especially so as regards silver, the only metal with which the Sheffield office has to deal. The letter which appeared in one of our local papers some time ago proposing the restoration of this method, evidently referred to gold, the measure of exactness being quoted in carats, and consequently this does not really concern the Sheffield silversmiths. The old office in Fargate was in 1880 sold to the Corporation for town improvements, the proceeds covering the cost of the present buildings. The lion formerly over the front door, which was attributed to the chisel of Mozley, a man who worked for Ramsay, Sir Francis Chantrey's master, is now inside the building, over the entrance to the marking room. Committees have on several occasions been appointed to inquire into the Assay Offices, but their reports have invariably commended the working of the institutions at Sheffield and Birmingham, and the silver passed at those two offices has always been up to the full legal requirements. The last report of this kind was at the end of 1887, when a deputation from the Board of Trade visited Sheffield in connection with the Merchandise Marks Act, 1887, which required that a local distinguishing mark for watch cases of foreign make should be adopted. The mark ultimately selected by the guardians of Sheffield for this purpose was four arrows crossed upon an octagonal shield, the word "Foreign" and the date letter also appearing upon the shield. In their report the deputation say, "that as regards London, Birmingham, and Sheffield, they found accurate balances and modern appliances had been adopted, but in other offices less accurate and even primitive methods of treatment had been retained," some of the furnaces and balances in use being those of the 16th century. Several books in use at the office are the same as were opened at its establishment, *e.g.*, the minute book, goods broken book, and bank pass book. The latter commences October 2, 1805, when Messrs. Walker, Eyre, and Stanley had the banking business to which the Sheffield and Rotherham Bank succeeded.

Glancing over the Books is most Interesting.

One sees in these books the names of places and streets showing the great changes which have taken place in our town and its surroundings. There are, too, the names of men and firms which once were great, but are now no longer known to us, whilst we recognise very early in the register the names of silversmiths still persisting and familiar, such as Fenton, Creswick, Morton, Roberts, Hall, Wilson, Mappin, Rodgers, Harrison, Nowill, Wilkinson, Bradbury, Thompson, Eyre, Martin, Briggs, Atkin, Dixon, Hawksworth, Hutton, Walker, and Hutchinson. Maps of Sheffield date from 1741 forward to the present time, lent by Mr. Mitchell-Withers, were exhibited, and Mr. Watson briefly referred to the changes which had taken place in the topography of the town as indicated in the register of the office. One of the most curious points arises in connection with a place called "Brinsworth Orchard." This name appears in the Sheffield register frequently about the date September, 1773, and yet on the map, dated two years earlier, there is no such place ; but we find the land extending on both sides of Orchard Street from Fargate to Church Street, called "Brelsforth Orchard," and it seems as though the name must either have been an error on the map or have been changed within those two years. The latter seems the more probable, as Brelsforth is a Sheffield name. Examining the plate books of just 100 years ago, some rose leaves were found, and the writer suggested that his audience might for a few moments rest their thoughts by picturing to themselves some of the possible or probable circumstances under which those leaves found a resting-place in that musty volume. The plate books indicate, more or less, the changes which have taken place in tastes, pursuits, and fashions. To ascertain these analyses had been prepared for four periods of a year each, at intervals of twenty years, commencing with the opening year of the office ; and three months from 1886 have also been analysed. In the years 1773-4 several hundreds of buckles and coat and "braist" buttons were assayed, reminding us of the days when our grandfathers wore wigs, knee breeches, and shoes. There were also whip caps, saddle nails, apple scrapers, scales and weights—for they weighed their money in those days—and a large number of punch ladles. It seems also to have been the fashion to make "tea kitchens" of silver. With the exception of punch ladles all these articles seem to have gone out of fashion within the next twenty years. The ladles survive until 1793. Salts appear to have been in great favour in 1773, but afterwards declined, though now they are more freely made than ever. The quantity of bottle trays, stands, tops, cork mounts, and bottle labels assayed between 1773 and 1833 points to the jovial proclivities of our ancestors up to the time named, and probably up to a somewhat later date. Coffee pots are found to have been frequently made of silver in 1773, but teapots seldom appear in the analysis until twenty years later. Knife blades and handles were made in 1773, and evidently rose in favour to 1813, from which point they have declined. Silver candlesticks have fluctuated, reaching the maximum in 1793, and the minimum in 1832, indicating possibly the competition of gas, but they are now gaining ground once more. Muffineers first appear in the 1793 column, and after almost dying away are now very largely made. We find, too, spectacle frames in this period, reminding one of the heavy arrangements which our forefathers wore upon their noses, also egg cups and wands, scissor bows and cases. In 1813 there seems to have been a strong demand for boxes, but it has now almost ceased, and we find in that year for the first time cayenne spoons (spelled "Kyan"). Ice pails and match boxes are also included, and inkstands and snuffers then reached their highest points. Cans and forks appear in 1832. The last period of 53 years is remarkable for the great number of luxuries introduced—ashes trays, claret jugs, cigar cases, napkin rings, cheese-scoops, spoons for special purposes, ice, coffee, etc., menu holders, sugar sifters, trowels, and an immense quantity of ferrules, and caps for mounting handles.

The Silver Duty and Hall-Marking.

Throughout the paper Mr. Watson carefully avoided going into the question of the retention or abolition of the duty and hall-marking, or the legalising of a multiplicity of standards—explaining that he considered it better that no opinion should be expressed on these matters by an official. He said, however, that for what it might be worth, he might inform them that his experience was that if silver which was intended to be made up into goods not to be hall-marked accidentally came to the office, it always proved considerably below standard, from which it might be inferred that, with a voluntary system, English silver, instead of being as now, with but few exceptions of recognised high quality, would soon become of a very mixed description. Referring to the picture suggested in the Press some time ago, of the Assay Master sitting in the midst of 100 teapots, waving aloft in triumph a bit of "joint wire" which he had found, and, armed with a large hammer, thoroughly enjoying himself by dealing destruction around, he said that when it was considered that joint wire is not required to be assayed, and that the experience of the past ten years was that only one ounce in 976 was broken up, and that only about 40 teapots passed through the office in the course of a month, he was sure his audience would pity the lot of those who had to wait so long for their pleasures. The guardians of the office, of course, occasionally had to put the law in operation, but such cases had been remarkably few, and as the offenders had paid their penalties, he would not trouble his audience with particulars, and pillory the parties a second time. He thought he had shown that the officers of the company had from its incorporation faithfully and zealously discharged their duties as the guardians of the standard of wrought plate in the town of Sheffield, for which the community should be deeply indebted to them, and not only for this, but also because they can, associated with Birmingham, claim to have raised the quality of the silver standard throughout the entire country by insisting upon the legal requirements being complied with, a fact of which the guardians of the present day were probably unaware, but of which they might, nevertheless, be justly proud. It would, he said, perhaps be expected that he should make some reference to

The Piracy of the London Hall-Mark

so prominently displayed last week in a local paper, but all that he could say was that he was astonished that so much could be made of so little. The fact that a Hall-mark could be copied by a clever knave no one would doubt, neither would it be disputed that bank notes and coin could be forged, but no one on that account contends that bank notes and coin must be abolished, or that there is any reason for public confidence in them being shaken. It is true, he said, that a number of persons were deceived by the forged Hall-marks, owing to their not having examined them with sufficient knowledge and care, but when the articles were submitted to him, he at once declared the marks to be forgeries, giving the authorities his reasons for the opinions he expressed, and he regretted now that he did give reasons, since they had, very unwisely in his judgment, been made public, and he feared the ends of justice might thus be defeated rather than helped. The one thing needed was that the risk run by the forger should be made so great, that "the game should not be worth the candle." It might be that the recent more frequent attempts at forgery are to show us that in these days, when to become a criminal is to become an object of compassion, and the punishment is made so slight by the ticket-of-leave system, the risk run is laughed at, and has ceased to be a deterrent.

The lecture was illustrated with specimens of old Sheffield plate and silver lent by Mr. Thomas Bradbury, and modern electro-plate goods by Messrs. T. Bradbury and Sons.

The Chairman said they had listened to a most instructive and interesting lecture, and he trusted it would be published *in extenso*. He moved a vote of thanks to the lecturer.

Mr. F. E. Smith, who seconded the proposition, regretted that some of the Birmingham houses excelled Sheffield houses in the style of their work. Many of the Birmingham houses had a name in London, even before that of the leading Sheffield houses. He thought those in the trade in Sheffield should aim at keeping up their repute.

Mr. Allen supported the vote of thanks, and remarked on the antiquity of the system of weights which was at present used.

The resolution having been carried, Mr. Watson briefly replied, and the proceedings terminated.

Personal Adornment.

PERSONAL attractiveness has had a very large share in the determining of the direction of the development of many races and families of animals. The brilliant plumage of the humming bird and the gorgeous tail of the peacock are the results of a long process of sexual selection; the male birds vieing with each other in point of good looks for the possession of the females. The females naturally preferred the most handsome males, and in this wise the most handsome survived to propagate the species. This personal attractiveness has not been without its effect in the production of many of the human races. In the early stages of development, the man by force wrests the woman from his less sturdy neighbour, and keeps her for himself by decking himself with pigments and articles of adornment. If he is not possessed of a diamond solitaire for his shirt-front—or even if he doesn't possess a shirt-front at all—he can stick a piece of bone through his nose, and it thereupon turns up in a splendid disdain at his less fortunate brother, whose nasal cartilage is not thus adorned. If he is unable to present his squaw with a pair of massive gold pendants for her ears, he can at least give her some more weighty though less costly substitute, which will quite as effectively destroy the beauty of that shell-like organ. And if he cannot purchase a dainty ornament of tortoiseshell for the hair, he can readily thrust a stick through those dusky, greasy tresses of her's. Thuswise doth the "poor heathen" gratify the instinct of personal adornment, and from such small things as these, through many years and in many lands has jewellery developed.

It is not jewellery alone, however, which is the sole adornment of the person, but it is jewellery which only and solely serves the purpose of adornment. Even in its very earliest stages jewellery was purely a thing of ornament—an extraneous adjunct of dress. Dress has also been made to serve the purpose of adornment, but in its primary form it was for use. Dress is economic, that is, it was before the advent of the dressmaker; jewellery is artistic, or at all events it should be. Dress is for the purpose of clothing, jewellery serves no useful purpose whatever. Despite this, however, the instinct for ornamenting the person is in many cases more powerful than the instinct for clothing the person, and this applies quite as much to the civilised as to the savage. When Missionary Societies sent out blankets to the unclothed aboriginal of some far off tropical island, the first purpose to which they are put is that of personal adornment, and from history we may learn of the joy with which a native chief will strut about in the "blanket and top boots," which have now become proverbial. Or to take another instance, we find that beads and cheap fancy articles are far more acceptable to the Kaffir or Hottentot than the finest piece of linen or silk, or even where greater physical comfort would be acquired by the acceptance of articles of clothing, the body is deprived of it, in order that the craving for adornment may be satisfied.

This tendency is as apparent in Kensington as in Kentucky; in Piccadilly as in Patagonia; and only proves the old, old story that a man's a man the world over, and for the matter of that a woman's a woman too!

Thomson—that most misquoted of all poets, says:

"Loveliness
Needs not the foreign aid of ornament,
But is, when unadorned, adorned the most."

And Thomson was correct in a large measure, but, however true his lines may be in theory, in practice we find that beauty when adorned is far more effective than when arrayed only in its native charms. The flashing of the diamond; the rich glow of the ruby; the insidiously beautiful ray of the emerald, all add their quota to the effect produced, and the triumphant beauty becomes a more terrible conqueror, when arrayed in all the splendour of her sparkling jewels. The softness of the pearl, and the repose of the opal add to the subduing influence; the dreamy, utter subjugation induced by the languishing wearer thereof. It may be that Nature, free from all extraneous aid, is beautiful in itself and requires no adornment, but the instinctive craving for ornament is a natural craving developed through long periods of time, and there is no reason why this natural want should remain unsatisfied.

It is not always that ornament is utilised for the adornment of the lovely, for it is frequently called into requisition to correct or gloss over faults of nature, which otherwise would be obtrusive and ugly. Some faults and blemishes there are which no amount of adornment whatever will correct; but a judicious use of ornament will go very far, in some instances, towards softening and toning done an objectionable disfigurement.

Therefore, although it cannot be said that jewellery is useful, it serves a useful purpose. It makes the beautiful more beautiful, and it renders the plain—to put it mildly—less plain. All men and women desire it and all wear it in some form or another. It is sometimes used lavishly and sometimes sparingly. Occasionally we come across a vast display upon some person, when we feel how vulgar it is; but in many cases the vulgarity is in the wearer, not in the jewellery, which if worn with taste and judgment would produce a good effect. With dress it is the same as with jewellery which has always been an accessory of dress. So much depends upon the taste of the wearer. The *Modiste* cannot force upon a person that which she will not wear, no matter how well it is fitted for her and how well it suits her; any more than the jeweller can make his customer purchase his most artistic wares, if the said customer is bent upon buying that which is devoid of all artistic feeling whatever. The art of personal adornment may be developed into a very high art indeed, for there is so much scope for individual feeling and suggestion in the plasticity of dress fabrics and in the ductility and malleability of the precious metals.

The crude conceptions of primitive man are slowly giving way in all directions, but the time has not yet arrived when men and women indicate as clearly by their dress and adornment what they are and what they feel, as they do by their deportment and conversation. There is infinite resource in this art, and its development is a matter of time; but there are many things which might with advantage be studied, in order that this development might be hastened. A slight knowledge of the more rudimentary principles of art is becoming disseminated among certain classes of the community at the present time, and this in time will produce a good result, but it is a different factor to this which will have the real effect, and the rapid consummation. This factor is the producer of articles of attire and adornment—the *Modiste* and the jeweller. We are very pleased to observe that there is a tendency at the present time in favour of the production of articles, which in many respects are constructed in accordance with artistic principles. In jewellery there is an undoubted demand for single pieces of original design, instead of the great wholesale orders which were once the fashion, and with this demand there is the expressed willingness on the part of the purchaser to pay, not only for the metal, stones, and fashioning of a piece of jewellery, but also for the artist's design. This is something to be grateful for, and we look confidently into the near future for a further and greater development in this direction. This result has been obtained at much cost by those manufacturers who have sacrificed profits in order that better work might be turned out. For a long time such work, as must necessarily have been the case, lay unheeded, but at last the reward came, and a demand for it arose.

Development of this spirit among manufacturers is the potent factor required to abolish ugliness; for if people cannot obtain inartistic goods, they will be forced in spite of themselves to purchase those which are artistic, and in time the influence of this enforced purchase will be felt, and the result will be the craving for the ugly will become less vehement, and, we trust, ultimately fade away and be seen no more.

W. Kineton Parkes.

Long Terms and Accommodation Bills.

PART II.

BEFORE proceeding with this second portion of our subject, it will be well perhaps to arrive at a satisfactory definition of the term "Accommodation Bill." We might possibly not have thought this necessary, deeming that the term sufficiently explained itself, but that we have a lively recollection of hearing a certain notorious bankrupt, who is at the present moment doing penal servitude for his offences, emphatically deny ever having given or accepted an accommodation bill. The result of his examination clearly showed that his idea of "accommodation" was vastly different from that of the majority of men.

We would therefore define an accommodation bill as, firstly, *any genuine bill or promissory note given as evidence of and security for money borrowed*; and secondly, *any such bogus bill or note executed simply for the purpose of raising money by discounting*. Or, again, a shorter and yet more comprehensive definition would be *any instrument given as cover for any other "value received," than a genuine trade account.*

Doubtless in a sense all bills passing in the way of business are accommodatory. The creditor wishes to have the use of his money before the debtor is willing or able to pay, hence a bill is drawn and accepted, to their mutual satisfaction, and unfortunately in the long run to their mutual disadvantage. The buyer sacrifices his cash discount, which however is no gain to the seller as he has to pay as much, probably more, to discount the paper, while he also has to face the possibility of the bill being dishonoured at maturity. The whole system is illusive and insecure. The apparent gain is far more than balanced by the actual loss. Each party may talk with self satisfied glibness of "turning the money over and over again," and such-like delusions, but when critically examined the so-called benefits prove utterly worthless. Underneath all is the constant volcanic energy of insecurity, while the incidental discounting expenses, are, in the aggregate, an immense and actual loss to the trade at large.

All this would be at once remedied by the adoption of the system of prompt cash payment as advocated in our last article. The trade would be at once placed upon a thoroughly trustworthy and safe basis, while the present leakage would be absorbed in the legitimate extension of our industry.

But our more immediate purpose is the consideration of accommodation bills pure and simple. Reverting then to our definitions we will treat first of such documents as are genuine and straightforward in their character and intentions, but which are not regular business payments for "goods sold and delivered."

It is easy to understand where the necessity for such instruments comes in. It may be an honest endeavour to foster a small beginning; to help forward a growing business; or it may be the spirit of speculation, and the effort to do a large trade on a small capital. In any case money is wanted, and money has to be borrowed; and all is well until the acceptance falls due. Then comes further negotiations, a renewal is arranged for, and a fresh percentage is sacrificed as interest. And it is fortunate if the matter is settled thus easily; if, meanwhile, no further advance has been found necessary; if no deeper liability has been incurred. But too often, far too often, the case is otherwise. The requirements of the business increase faster than the profits accumulate, and thus again and again is the help of the obliging "friend" invoked, and fresh loans obtained. The adjustment and renewal of these various bills soon becomes a part of the ordinary routine of business, and is treated with an indifference which is fatal to the well-being of the concern. Large sums are periodically paid for discounting in ignorance or forgetfulness that it is actually the *profits* of the business which are thus being sacrificed.

Possibly under special circumstances, with some exceptional production to push, a business may be carried on under this system, and yet show a fair profit. But with any ordinary employment, and especially amid the keen competition and constant reductions of the jewellery trade, it simply means ruination.

We do not mean to infer that these evils are apparent and acknowledged from the first. No! The way seems so easy, and the prospects bright. Trade will soon be getting better; prices will rise in the near future; accounts will come in promptly without collection, and so we shall be able to pay back all we have borrowed, and then go smoothly on. Such like sophistries are only too tempting, even while the list of liabilities is steadily increasing. Unfortunately however, the facility with which a bill is accepted is equalled only by the difficulty with which it is taken up at maturity. The "good times" of our imagination do not come in fact, and the burden gets heavier and more unmanageable. The day of settlement must of necessity come sooner or later, and it is sure to bring with it disappointment and trouble, and probably disgrace.

Possibly after struggling for years and years under these enervating circumstances, a man finds his declining energies unequal to the task of properly managing his business, and he has to bow to the inevitable; and in his old age has to begin life again on a more lowly footing. Or again; he may pass entirely away while the burden still rests on him, leaving nothing but perplexity to his executors, and for the support of his family simply the ruins of what they always supposed to be a flourishing business.

And say oh! many of our fellow workers, if this is but a fancy picture; if these are simply imaginary possibilities. You who suffer the almost daily anxiety of arranging and providing for your constantly recurring loans, you who can only fill up one gap by making another, think seriously over the matter and say is it worth your while—does it pay? If the actual interest you have to lose does not deter you, at what rate per cent. do you value the mental strain involved—the worry and sickening dread of a dishonoured bill and ruination that is ever with you. This "black care" which is far worse in its effects than all the genuine work of a life time. Have you ever thus reckoned out the real rate at which you pay for your accommodation? These "Accommodation Bills" are twice cursed, being fraught with equal danger to those who give and to those who take. Their ruinous mode and the serious drain they prove to the trade generally, are sufficiently evidenced by the large dividends of our Banks, and the opulent fortunes of the too obliging money-lenders.

In addition to this professional advancing there is an immense amount of what may be called amateur discounting done between supplier and customer. The routine here is the same; the effects are identical. The manufacturers support a number of needy and practically insolvent factors; the factors in their turn bolster up a lot of rotten shopkeepers. Doubtless, to use the stock phrases, "the trade is kept together," "customers are retained," "a large turn-over is effected," by these means.

There is of course a certain amount of profit made on these transactions, this being represented by the difference between what a man charges for discounting and what he can get the bills re-discounted at under his own endorsement. It is supposed to be business, but as to whether it has proved to be good or bad business let the unsavoury pages of the Gazette give evidence.

It is absolutely impossible to estimate the amount of this almost worthless paper that is floating about in the trade, nor can any definite idea be formed of the average percentage charged. We have known a modest five per cent. suffice under favourable circumstances; while in other cases, we believe the Hebraistic ideal of "*shent per shent*" has been realised.

Wherein lies the remedy? There is no remedy but common-sense, discretion and patience. We have pointed out the evils without consideration to personal feelings; let the lesson be taken to heart, and the evils will speedily be remedied. It is the endeavour to force a business beyond its powers; the ambition to do a far larger trade than our capital will honestly allow—that is the origin of all these monetary troubles. We must keep within our means, limiting our ventures to the legitimate forces we have at command. We must be content to work our business carefully up, step by step, rather than to try to force an exotic growth by means of imitation sunshine. Surely it is better that we should employ our abilities and our strength on that which is certain ultimately to repay us, rather than that we should waste them in fruitless financing and profitless display. Steady, conscientious work, and the gradual development of an undertaking will pay far better in the long run, than the rapid but uncertain advance by means of borrowed capital.

Here again we would ask, is this simply a fancy picture,—is it merely imagination? The records of the past answer as emphatically here as they did in the other case. Look at the successful men of business who have progressed slowly and surely to a fortune. Look at the small beginnings which have grown to immense and successful concerns. Need we emphasise the moral?

As to our second definition, we do not intend to say much respecting these "Bogus Bills" which are sometimes put into circulation amongst us. They have no place whatever in business, properly so called, belonging as they do, completely to the realms of dishonesty and swindling. That they have an existence is only too certain; how else can we account for some of those immense claims which have appeared in some of the bad failures of the past? Debts which were totally out of proportion to the amount of business done, have time after time been put in, and supported by documents which we have not the least hesitation in classing under the title we are now considering. And it is here that these bogus instruments affect us all—both honest and reckless traders. It is bad enough that a man should fail to meet his liabilities, but when his small dividend is further reduced by false claims and counterfeit creditors, it is doubly exasperating.

There is, however, so far as we can see, no help for it. There will always be more or less of rogues around us, and wherever the possibility of swindling occurs, there will always be someone ready to take advantage of it. The only way is for us to look more closely into the characters, means and positions of those with whom we do business. This will save us from trouble on the part of those who are dishonest simply from circumstances, but no amount of caution will keep us from the intentional swindler. If a man sets out with the special design of robbing us, the chances are a thousand to one that we shall be robbed. Much might be said of the deterrent effect of severe and summary punishments on this class of unjust bankrupts, but it is somewhat beyond the scope of the present article.

Nor do we intend to speak of Bills of Sales, which being held simply as security and not negotiable, do not come within our purpose, their injurious effects being to some extent neutralised by the necessary registration.

Have we not said enough to illustrate our meaning, to enforce our purpose? In how many a business, carried on under the conditions of which we have been speaking, would immediate realisation, or the withdrawal of support, from any cause whatever, mean immediate ruination? How many of you who are carrying on business under this deceptive system can tell if you are really solvent or not? You struggle on year after year under cramping conditions and on a false basis, in constant uncertainty as to how long you can keep afloat.

How much better would it be if all this could be abolished; if every business, large or small, could be established on a solid cash foundation, and be firm and safe throughout. Then all profit would *be* profit, and would not be swallowed up in ruinous discounting expenses. Then a glance through the ledger would show at any time our actual position without having resource to its unsavoury adjunct, the bill book.

May the time soon come.

Manufacturer.

Birmingham, *October*, 1889.

Imitation American Clocks.—The German manufacturers at Mannheim have been making "American clocks" so cheap as to undersell the foreigners, but the quality is so bad that, on the authority of a contemporary, the output of the factories is falling into disrepute.

Turquoises.

NO precious stone has been credited with so great a share of occult properties as the turquoise; indeed, the value of this gem depended in the past, to a very great extent, upon the supernatural virtues which it was held to possess. By its hue it was thought that the turquoise indicated the state of its wearer's health. Any evil which awaited its owner was supposed to be foreshadowed by a change in the degree of its lustre. The man who bore upon him one of these stones increased thereby his powers of vision and insured himself against a fit of the blues, for one of its attributes was the engendering of a cheerful spirit in its wearer. The turquoise was an infallible remover of animosity between one who gave it and one who received the gift. Safety from falls was insured to him who carried it, for if the catastrophe was so severe as to endanger life or limb, the stone itself would fly to pieces, thus preserving its owner. The sky-blue gem was further considered a powerful agent in awakening the passion of love. Thus students of Shakespeare will remember that Leah gave a turquoise ring to Shylock "when he was a bachelor," in order to induce him to propose to her. Faithfulness was thought to be a prevailing characteristic of the turquoise. The death of its possessor was signalised by its altogether losing its colour for the time being, to recover it when a new owner appeared upon the scene. However little credence may, in these matter-of-fact days, be given to the various attributes of the gem which we have enumerated, it retains, to the confusion of scientists, the remarkable property of turning pale, becoming spotted, or assuming a whitish tint in the most unaccountable manner. Not very long ago the Shah was presented with a magnificent turquoise as large as a walnut, which quite lost its colour after it had been in his possession for a short time. Unfortunately, stones which so far forgot themselves as to part with their colour in this mysterious way are far more common than those which show a reasonable amount of steadfastness. This curious characteristic is quite foreign to the nature of precious stones taken as a class. One of their most highly prized qualities is their immutability; and the only one which rivals the turquoise in its chameleon-like performances is a species of opal found in Mexico. It is a peculiar fact that both this opal and the turquoise contain a large percentage of water; so in all probability the explanation of their puzzling property may be looked for here.

We are so accustomed to regard the turquoise as the embodiment of all that is brilliant and pure in blue, that we are apt to forget the green turquoise which was so popular some little time ago. It is a very beautiful gem, but unfortunately resembles strongly other less valuable minerals. People who wear jewels like them to be of a kind that has unmistakeable value, and consequently the green turquoise has quite gone out of fashion. There is a bastard blue turquoise, but it is luckily a great deal softer than the true stone. It is known as bone or fossil turquoise, and is found in Siberia and parts of France. Scientists say that it is nothing more nor less than the tooth of some fossil creature which has gained its brilliant colour by long contact with phosphate of iron. "Odontolite" is the name used to distinguish this substance from the true gem, and jewellers also distinguish the two by naming the real Simon Pure "the Oriental turquoise," while they call the other "the Occidental turquoise." Besides its inferior hardness, the latter is to be recognised under the microscope by the peculiar pattern of the dentine which is always traceable in it. There is not much difficulty in imitating a turquoise in glass; but the false stone cannot be made to assume the brilliancy of the real. Turquoises are found in China, Thibet, Palestine, and Mexico. Arabian turquoises usually come to light in the gravel beds of mountain gorges, where they are washed in the rainy season. No doubt systematic mining in the hills of Arabia Petrœa would result in the discovery of many valuable specimens of this beautiful gem, for it seems, so far, to have been just picked up by chance there. But it is from Persia that the only really fine specimens come. The principal mines are situated in the province of Khorassan, which lies south-east of the Caspian Sea, and are about 40 miles west of the town of Nishapore. From accounts given by travellers in the land of the Lion and the Sun, it appears that the stones are localised in one particular hill, which contains six perfectly distinct mines. These latter do not at all fulfil our idea of a mine with its elaborate workings, but are mere pits in the ground, dug without any skill, and in which the only process followed has been to turn the earth over and over in the search for the blue gems. The mines are worked by the inhabitants of the villages in the vicinity, who purchase the right of hunting for turquoises from the Government. Sometimes they band themselves together in companies, and divide equally the profits arising from the sale of the stones they may find. Among their customers are travelling merchants, who make periodical visits to the mines, and who either purchase the stones themselves or pieces of rock which bear evidence of their being embedded in it. A town in the district called Mushed is the chief centre of the turquoise trade. The men who are skilled in cutting the stones are to be found there, and there most of the produce of these famous mines gravitates. About a couple of hundred men actually dig in the mines, but many more are dependent upon the industry in some way or another. It is indeed said that the inhabitants of all the villages in the neighbourhood, amounting in the aggregate to about 1,200 souls, look to the turquoise for a living. The great profits that may be realised by a lucky find make them a very improvident race. They are all eager to get money by finding turquoises or dealing in them, and the result is that agriculture is neglected almost entirely. As is only to be expected, the money so easily gained is quickly spent, and a man who has been fortunate will in a few weeks, through dissipation, spend an amount of money sufficient to have kept himself and his family a year or more if it had been carefully used. After the turquoises have been cut in Mushed they are despatched to all parts of the world. Many of the finest find their way, *viâ* Herat and Candahar, to India, where they gain ready purchasers among the wealthy rajahs, who set great store upon this particular stone. Merchants trading with Russia, however, manage to get hold of some good turquoises, and by their agency some very valuable stones are brought into Europe direct. In days gone by, Turkey was the great mart for the turquoise, a fact to which the gem owes its name.

The hill in which the turquoise mines are situated is full of crevices, and in these blue veins appear, which are presumably formed by the oxide of copper that seems to give its colour to the stone. The largest specimens are found in a kind of ocherous clay, and it is noticed that the more productive the mine the more varied are the tints of the rocks which form it. Speaking generally, the hill is composed of porphyritic rock, diversified by beds of clay and conglomerate tinged with iron, through which the blue veins wander in an apparently aimless manner. The miners work with pick and crowbar, and so conservative are they that it is only within comparatively recent years that the use of gunpowder for blasting purposes has sprung up amongst them. As a matter of fact the introduction of gunpowder into mines has not proved an altogether unmixed blessing, for though by its help it is possible to search much more rock than could be examined otherwise, the force of its explosions is found to frequently shatter into pieces valuable stones which would have been unearthed intact by the slower, but less violent, process. The inadequate manner in which the workings of those mines which have really been carried into the ground are propped up, leads to many accidents; no proper precautions whatever are observed in this respect, so, as is only natural, the miners have to pay dearly for their carelessness. The value of turquoises depends at the mines entirely upon their hue. Stones of a deep sky-blue colour are so highly prized that as much as ten pounds of our money is given for one only as large as a pea. The colour must, however, be without blemish. The smallest speck of lighter hue than the rest of the stone, or the faintest tinge of green depreciates the value by at least a half. The Shah, who possesses the finest turquoises known, has one which is valued at two thousand pounds.

Defective Sight and its Optical Correction.*

By W. D. Mason, A.P.S.

(Continued from page 99).

ASTHENOPIA.

ASTHENOPIA, or weak sight, is much less prevalent than commonly supposed.

Most people complaining of weak sight are either suffering from one of the defects of vision already described, or from actual disease of the eyes or eyelids, and very often from both together. Occasionally, however, weakness of the muscles of accommodation or convergence is met with when the sight is otherwise perfect.

Sometimes a young person in a weak state of health, and with perfectly normal distant vision, will complain that it is impossible to read or employ the eyes on any near work for more than a few moments at a time, after which dimness of sight, pain, and watering of the eyes compel him to desist from the effort.

The remedy is, first to improve the general health, and then to order the weakest convex lenses with which the patient can read comfortably for a few minutes at a time.

The eyes should then be gently and regularly exercised in reading, for short periods at first, afterwards longer, but not long enough to fatigue them, and the strength of the lenses should be decreased from time to time as the eyes grow stronger.

Occasionally, when the weakness is in the convergence muscles, prisms have to be used.

Prisms are wedge-shaped glass lenses with flat surfaces. One edge of a prism, called its base, is much thicker than the other, and upon the relative thickness of its edges depends the strength of the prism. The larger the angle at which the two surfaces are placed to each other, the stronger the lens; and the smaller the angle the weaker the lens.

These lenses possess the property of apparently displacing objects, and in following the displacement the eyes are made to turn away from the base towards the thin edge of the lens.

Prisms held before the eyes with their bases inwards call for a diminished amount of convergence in viewing near objects.

If placed with their bases outwards the demand for convergence is increased.

By means of prismatic lenses the convergence may be rested while the eyes are occupied with near work, in the same way as the accommodation is rested by convex lenses.

Combination lenses, convex on one side and prismatic on the other, are also made, and concave combination lenses on the same principle.

Prisms are not often prescribed, as equally good results can be obtained, in the majority of cases, by the use of properly selected spherical lenses, and these may also be made to act as weak prisms by so arranging them in their frames that the centres of the lenses are not quite opposite to the pupils of the eyes, but a little closer together or wider apart as required.

Whatever lenses are prescribed, the eyes should be exercised daily, though not to a fatiguing extent, as the muscles of the eyes, or any other part of the body, can never gain strength by entire disuse.

Weak sight is comparatively rare. It is not dangerous. It is far more difficult to deal with than the other defects of vision, but, by proper treatment, great improvement, and often a permanent cure, may be effected.

ODD SIGHT.

Odd sight is a difference in the refraction or amount of accommodation in the two eyes. Sometimes one eye will be myopic and the other hypermetropic; one astigmatic and the other not; or one normal and the other defective. But it is much more usual to find the same kind of defect in each eye, but different in degree.

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It seems a very simple matter to test each eye separately, and then use the different powers indicated; but this often gives rise to considerable discomfort, as the better eye has been in the habit of doing most of the work, and the other cannot all at once begin to do its full and equal share without strain. The eyes, in fact, must be trained gradually to work together.

When the difference is more than trifling, it is advisable to correct the defect of the better eye at once, and use a lens slightly stronger for the other at first, and gradually increase the strength of this lens from time to time until full correction is effected. The patient will then probably see better than ever before.

Sometimes, however, when the difference is very great, this cannot be done, and the best plan is to consider the requirements of the better eye, and a pair of glasses to suit it should be worn.

The worse eye, however, should not be neglected, but should be exercised daily by itself with its appropriate lens, and when it has thus been strengthened the attempt to wear odd glasses should be renewed.

Most odd-sighted persons object to the trouble and expense of getting perfectly suited with spectacles, and continue to wear a pair adapted to the better eye, and virtually see with one eye only at most distances. But those who are not to be daunted by a little difficulty are in the end repaid by much more perfect and comfortable vision.

SQUINT.

Squint is a deformity occasioned by a want of parallelism in the axes of the eyes when looking in the distance, or by unequal convergence when looking nearer.

There are two kinds of squint—convergent and divergent.

In convergent squint when one eye looks straight forward, and the other is turned inward. In the divergent kind one eye looks straight, and the other is turned outward.

The eye that looks straight is the real working eye. The other is the squinting eye, and sees little or nothing.

Convergent sight is very common, and in a very large proportion of cases the original cause of the affection is hypermetropia.

By being obliged to make a constant effort of accommodation without convergence for distant vision, and greatly in excess of their convergence for near vision, many hypermetropic persons feel a constant strain, and to relieve this the convergence muscles are brought into play even when the eyes are fixed on distant objects.

In time this state of convergence becomes habitual, so that instead of starting from a position parallel to each other when turned from side to side, the eyes start from a position of convergence to a point between them. Consequently one eye lags behind the other when they are turned sideways, and squinting is produced, first in one eye, and then in the other. After a time, through one eye being the stronger, or from some other cause, one eye is constantly used for seeing, and the other for squinting.

Squinting produces double vision, but the eye turned in a proper direction receives the image on a more sensitive part of the retina, and obtains much clearer definition than the eye turned sideways. The fainter image formed on the less sensitive portion of the retina of the latter is soon ignored altogether, and then the vision of that eye is said to be suppressed. From this time the sight of the squinting eye rapidly deteriorates, and it becomes almost or quite useless to its owner.

Divergent squint is comparatively rare. In most cases the cause is an excessive degree of convergence for reading or near work, and this occurs only in myopic eyes. Progressive short sight demands convergence to a greater and greater degree, until sometimes the overtaxed muscles suddenly give way, the eye flies outwards, and relief is obtained at the expense of binocular vision.

To prevent squint, or cure it in slight cases and at its commencement, properly adapted spectacles must be used. In more serious cases, and all cases of long standing, a surgical operation is necessary, not only to obviate the unsightliness of the deformity, but also to save the sight of the eye. After the operation lenses must be selected in the ordinary way.

CATARACT.

Cataract is an opacity of the crystalline lens. In healthy eyes the lens is perfectly clear and transparent, but occasionally it becomes milky and turbid, and can be seen as a pearly or whitish substance behind the pupil. The disease is of constitutional origin, except when caused by wounds or violent injuries of the lens.

Both eyes are generally affected though not always at first, and blindness more or less total is the result.

The only remedy is the removal of the lens by operation. In all but the very highest degrees of previous myopia, the eye, without its lens, is left so hypermetropic, that there is no clear vision for distance without a strong convex lens to take the place of the one lost from within the eye. A still stronger lens must be used for reading, to supply the place of the accommodation which is wholly lost.

With two pairs of these strong spectacles, one for continuous ordinary wear, and another for reading and all close work, most patients after cataract operations see fairly well.

(To be continued.)

Applications for Letters Patent.

The following List of Patents has been compiled especially for *The Watchmaker, Jeweller and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; and 6, Lord Street, Liverpool.

14,578. S. H. Harding, junr., London, for "An improved clock-dial, chiefly designed for use in signal stations." (Complete specification.) Dated September 16, 1889.

14,707. J. Warlow, London, for "Improvements in the mode of and means employed for suspending pencil cases and the like from watch chains." Dated September 18, 1889.

14,732. I. Brown, London, for "An improved chain link." Dated September 18, 1889.

14,770. E. J. Railton, London, for "Improvements in gold screening apparatus." Dated September 19, 1889.

14,851. F. Ecaubert, London, for "Improvement in the method of manufacturing watch cases, and in tools made use of therewith." Date applied for under convention, May 8, 1889.

14,917. C. J. Fletcher, London, for "A combination 12-hour and astronomical (24-hour) dial for clocks, watches, chronometers, &c." Dated September 21, 1889.

15,037. F. Diss, London, for "Improvements connected with means for supporting or fixing jewellery and the like, applicable also to fastening certain articles of jewellery." Dated September 24, 1889.

15,067. A. J. Smith, London, for "Improvements in or relating to brooches." Dated September 24, 1889.

15,144. T. Lambert, Plymouth, for "The extraction of gold and silver from pulverised ores or other matrix in which these metals are found." Dated September 26, 1889.

15,272. A. G. Burrell, Glasgow, for "Improved apparatus for adapting telephone line wires for use in synchronizing clocks." Dated September 28, 1889.

15,306. F. G. Faxon, London, for "Improvements in watch pendants." Dated September 28, 1889.

15,329. J. Ashwin, Birmingham, for "Improvements in watch keys." Dated September 30, 1889.

15,388. J. Bastard and F. Redard, London, for "Improvements in watch glasses." Dated October 1, 1889.

15,491. O. Wilson, London, for "Improvements in brooch fittings." Dated October 2, 1889.

15,498. W. R. Lake, a communication from the firm of Friess and Walzer, Switzerland, for "An improved motor for clocks and other machines." Dated October 2, 1889.

15,682. J. Carter and W. R. Hutt, Birmingham, for "An improved watch key and swivel combined." Dated October 7, 1889.

15,711. J. Kendal and M. Lavel, London, for "A combination watch and appointment indicator." Dated October 7, 1889.

15,794. H. G. Green, London, for "Combination time pieces." (Complete specification.) Dated October 8, 1889.

15,875. A. Reznicek, Glasgow, for "Improvements in brooches, scarf pins, and similar articles." Dated October 9, 1889.

16,121. J. Darling and R. Starke, Glasgow, for "A time indicator." Dated October 14, 1889.

16,171. J. Cooper, Birmingham, for "Improved mode of attaching brooches, clasps, and such like fastenings." Dated October 15, 1889.

16,297. R. Turner, Bury, for "Improvement in watches." Dated October 16, 1889.

16,314. E. W. Hambledon and J. Carpenter, Bromley, for "Musical case for a watch." Dated October 16, 1889.

16,367. H. J. Linton and H. L. Symonds, London, for "Improvements in watch purses." Dated October 17, 1889.

16,501. W. S. Lockhart, E. W. Streeter, and W. Bashall, London, for "An improved process and apparatus used therein for the separation of precious stones or minerals according to their specific gravity." Dated October 18, 1889.

16,564. H. H. Lake, a communication from F. E. Morgau, United States, for "Improvements in apparatus for winding clocks by electricity." Dated October 19, 1889.

Recent American Patents.

Chain. W. H. Brock	411,575
Chocolate Pot. C. J. Mulford	411,870
Clock-striking Mechanism. R. B. Carr	412,018
Coffee Pot. R. W. Terrell	412.138
Earring. C. P. Pike	411,509
Electric Attachment for Eyeglasses. C. C. Smith	411.689
Hook. F. De Long	411,857
Metal Box. W. H. Atkinson	411,773
Micrometer Calipers. J. M. Irmen	411,444
Necktie Fastener. W. R. McCormick	411,871
Opera Glass Holder. E. B. Meqrowitz	411,527
Penholder Guiding Attachment. C. M. Gay	412,174
Process of Making Alloyed Raised Gold Plates with Corrugated Background for Jewellery. J. Bulova	412.017
Tea or Coffee Pot. L. S. Wright	411,483
Watch Case Pendant. W. W. Bradley	411.420
Watch Case Spring. J. H. Flemming	411,800
Watch Movement Box. W. H. Learned	412,030
Watchman's Clock Station. J. F. Scribner	412.045
Workman's Time Recorder. A. Dey	411,586

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller and Silversmith*, 7, St. Paul's Churchyard, E.C.

Gazette.

Partnerships Dissolved.

Durren and Carter, Reading, watchmakers. Rhodes and Lyth, Manchester, engravers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

To surrender in London.—Gregory, William, Strand, optician. McGrath. Isaac, junr., High Holborn, jeweller.

Public Examination.

In the Country.—J. Carnall, Sheffield, saw maker, November 7. at 11.30

Adjudications.

In the Country.—R. Whalley, Colne, Lancashire, and Barnoldswick. Yorkshire, watchmaker.

In London.—W. Gregory, Strand, optician.

Notice of Dividend.

In the Country.—H. C. Stickler, Frome, watchmaker. 4s. 5d., first and final; Wholesale Traders' Association, Birmingham.

Scotch Sequestration.

C. Coven. Glasgow, watchmaker.

The Deeds of Arrangement Act, 1887.

Kent.

Barham, George, 89, High Street, and Ash Villa, Bayham Road, Sevenoaks. watchmaker and jeweller. Trustee, Benjamin T. Norton, 9, Old Jewry Chambers, E. C., C.A. Unsecured Liabilities, £800 16s. 10d. Estimated Net Assets, £686 1s. 3d. Creditors fully secured. £350. Deed of Composition dated October 16. 1889; filed October 23, 1889.

Lancashire.

Longworth, James, 114, Cazneau Street, Liverpool, watchmaker. Trustee. Frederick John Elton, 28a, Church Street, Liverpool, accountant. Unsecured Liabilities. £46 16s. 3d. Estimated Net Assets, £70. Deed of Composition dated October 14, 1889; filed October 21, 1889.

Surrey.

Haberstroh, Markus, 143, Southwark Park Road, Bermondsey, jeweller. Adolph Maier, 194, Southwark Bridge Road, S.E., watch manufacturer. Unsecured Liabilities, £128 0s. 3d. Estimated Net Assets, £20. Deed of Composition, 3s. 6d. in the £, debtor covenanting to pay to trustee £5 per quarter, commencing October 20, 1889. Deed of Composition dated October 15, 1889; filed October 18, 1889.

Warwick.

Evans, Watts, and Co. (Joseph Watts, trading as), 9. Brougham Street, Aston, near Birmingham, wholesale jeweller. Trustee, J. H. Pierce, 83, Colmore Row, Birmingham, accountant. Unsecured Liabilities, £544 15s. 8d. Estimated Net Assets, £114 10s. Creditors fully secured, £75. Deed of Composition dated October 11, 1889; filed October 16, 1889.

York.

Wood, Harry, 37, Park Lane, and 67, Caledonian Road, Leeds, jeweller. Trustee, Isaac Senior, 30, East Parade, Leeds, accountant. Unsecured Liabilities, £182 12s. 4d. Estimated Net Assets, £50. Deed of Composition dated October 2, 1889: filed October 9, 1889.

BANKRUPTCY.

Re Edmund John Read, jeweller, Weymouth.—This examination in the Dorchester Bankruptcy Court was adjourned from the last sitting to enable further enquiries to be made respecting the proof tendered by Mr. Williamson, and rejected by the Official Receiver on the allegation that Mr. Williamson was a partner in the business. The Official Receiver now reported he had placed the matter before Counsel, but had not yet received his opinion. The Registrar, however, decided he could not further adjourn the matter, and the case was proceeded with. Mr. Dinn, of London, represented Mr. Williamson; Mr. Zillwood Milledge, the trustee of the estate, was present, and Mr. D'Angibau watched the proceedings on behalf of Mr. Hanger, a creditor. The Official Receiver's questions were chiefly in relation to an assignment of the lease of his house by the debtor, first to Mr. Warburg, and secondly to Mr. Hanger, as security for debts. Debtor said Mr. Hanger asked to see the lease of the house, and on his showing it to him he said he might as well keep it as security for the amount due to him (£100). Debtor allowed him to take it, and did not inform him another lease of the same house was held by Mr. Warburg. Both Mr. Hanger and Mr. Warburg claim their lease as security against the estate. In examination by Mr. Dinn, on this same point, debtor said he did not tell Mr. Hanger because he expected to be able to pay him his debt, thinking business would brighten up. He did not tell Mr. Williamson of his indebtedness to Mr. Hanger. He believed Mr. Williamson to be in partnership with him in the jewellery business, but he did not tell him he owed Mr. Watts for the fixtures of his shop. He had also contracted a small amount of debt without disclosing them to Mr. Williamson for goods the latter could not supply him. Mr. Williamson was to receive 50s. on the profits of the business. The Official Receiver said they were drifting into the question of the partnership. Mr. Dinn said he would put no further questions. The relationship between his client and the debtor must be determined by the deed of agreement. The debtor was allowed to pass his examination.

Re M. E. Goldstein.—The debtor, trading as a diamond merchant, at 106, Hatton Garden, has filed his petition, and upon the application of Messrs. Lewis and Churchman a receiving order was made last month by Mr. Registrar Linklater. The assets are estimated at about £250, the amount of the liabilities did not transpire.

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller and Silversmith, 7, *St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller and Silversmith.*

TO CLEAN BRASS CLOCK DIALS.

Can any kind reader of this journal give me a hint to the following?—Having a good many old brass dials to do up, I can manage it all up to the lacquering or varnishing of the silvered parts. I use mastic varnish, which does well enough, but if you happen to come over the same part twice it shows an extra gloss. What I want to know is the right sort of varnish or lacquer, and the mode of application. I have seen large silvered surfaces which had been lacquered or varnished, and which seemed to have been so evenly done. A hint on the above will greatly oblige a

COUNTRY JOBBER.

["Country Jobber" is referred to this month's *Workshop Memoranda.*—Ed.]

METALLURGICAL CLASSES.

Prof. Huntington would be much obliged if the editor would kindly direct attention to the following:—Metallurgical Department, King's College, Strand, London. Evening Work—Assaying, &c., of gold and all other ores and metals, alloys, fuel, &c. There are four free admissions to the course of lectures and to the laboratory. Application to be made to Prof. Huntington.

Metallurgical Laboratory, King's College,
Strand, London, W.C.

The Watchmaker, Jeweller & Silversmith.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

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MESSRS. BOSCH, BARTHEL & Co.,

409, George Street, Sydney.

EDITORIAL

Now that trade is enjoying in a marked degree the blessing of prosperity, men of business (having in mind the various fluctuations that have taken place of recent years) are somewhat anxiously enquiring in many quarters how long the present high pressure is going to last. It is, of course, admitted that the pace is too hot to go on for long, that the overtime and other feverish evidences of the "boom" must come to an end sooner or (comparatively) later; the question is, when is it to be? In our opinion, such a period as the present is the very best time for trading communities to look around and survey themselves and others for purposes of comparison. Without considering more than very primarily, the laws of political economy in the connection, it cannot but prove of the utmost importance for manufacturers to frequently take stock of themselves and their competitors in this direction. As Bishop Butler says: "Things are what they are, and the consequences of them will be what they will be. Why then should we desire to be deceived?" Why indeed? Unfortunately it is an inherent part of our nature, this desire, and even where it is directly prejudicial to our best and most vital interests, it is plainly to be distinguished.

One of the most marked results of our desire for self-deception is shown in the manner it affects our colonial trade. The trade report of Canada for the last year shows that her dealings with the United States are heavier than those with Great Britain. Canada sold to the United States in 1888, merchandise to the value of 42,572,065 dols., and to Great Britain goods to the value of 42,094,984 dols., showing an excess of sales to the United States of 500,000 dols. The imports from the United States were 48,481,848 dols., being 9,000,000 dollars greater than those from Great Britain.

The volume of trade with Great Britain (imports and exports) was smaller in 1888 than in any year since the formation of the

Canadian Confederation in 1867, while the trade with the United States was larger than in any preceding year, except 1882 and 1883. Well, we agree with our friend the "Trader," when he repudiates "manifest destiny;" but still, the foregoing is by no means a satisfactory state of things, and is certainly indicative of a screw being loose somewhere in the business relations between the two countries, which optimists fondly regard as being so well assured—probably in their self-deceptive desire. As regards our own trades, there can be no doubt that both watchmakers and jewellers have been losing ground in the Dominion against the ubiquitous Yankee and the enterprising Swiss, as an excuse for which, it is idle to talk about the superior advantages derived by the former, either from contiguity or tariff rates, as, provided the goods were to suit the market, neither would keep them out, on account of the difference in their cost of production in favour of the home country. Indeed this is practically demonstrated in the case of a well-known firm in this country, who, making watch-cases on the American plan, save in labour sufficient to ship them to the States, pay the duty, and then leave a handsome margin for profit. No, we are convinced that the falling off is to be accounted for elsewhere; that it is distinctly attributable to one of two causes, viz.: want of adaptability on the part of English manufacturers to meet the demand of colonial taste, or failure on the part of the home trade to keep the colonials informed of what they were doing, and of so educating the colonial taste up to the home standard; or we might put it differently, and say, of keeping English styles in the front place in colonial markets, by judicious advertisement, or other representation. Should the foregoing argument be allowed, the remedy is in manufacturers' own hands. Both in our regular monthly issues, and the special editions published twice a year for colonial circulation, we offer at least one means of solving the problem, "how to regain and keep colonial markets for home producers," while the same circulation, by bringing buyer and manufacturer into direct contact with one another, will doubtless keep the former *au courant* with what is required in the matter of styles.

EMIGRANTS' INFORMATION OFFICE.—This quarter's Circulars, relating to Canada, the Australasian and South African Colonies, have just been issued; and a poster, giving a summary, is exhibited in every Post Office. Queensland is the principal Colony which gives assistance to emigrants, but limits it to the classes of single female servants and selected unmarried agricultural labourers. New South Wales, Western Australia, Cape Colony, and Natal also assist emigrants to a limited extent. This quarter is suitable for going to Australia or South Africa, but it is too late in the year to go to Canada. Farmers with capital, and female servants will find openings in all the Colonies; agricultural labourers in New South Wales, Victoria, Tasmania, and some districts of New Zealand, and to a less degree in Queensland and Western Australia; general labourers and navvies in parts of Victoria; railway navvies in Natal; and miners in parts of Tasmania and New Zealand. Owing to the continued rush to the gold fields of the South African Republic, there is still some demand in Cape Colony and Natal for mechanics generally, but mainly for men in the building trades, blacksmiths, wagon-makers, &c.; in other Colonies there is no special demand for mechanics. The Circulars may be obtained, *free of cost*, from the Office—31, Broadway, Westminster, S.W.; and ten separate Handbooks, with maps, one for each Colony, and a Professional Handbook, for 1d. each, post free, or, the eleven bound together, for 1s. 6d. A new Handbook, dealing with Emigrant Ships, Emigration by Boards of Guardians, County Councils, Emigration Societies, &c., was issued in August, price 3d., post free.

GENERAL NOTES

AVIS.—"A watch manufacturer offers his daughter in marriage (100,000 francs dowry) to the case-maker who shall construct the lightest gold watch case. Competitors to address to the office of *l'Almanach des Horlogers*, St. Imier." In a footnote to the above the editor of *l'Almanach* expresses the hope for the victor that his wife will be less light than his cases.

THE PEOPLE'S PALACE.—Mr. D. S. Maenau, Ph.D., F.C.S., &c., has been appointed by the trustees Instructor of Chemistry in the People's Palace Technical Schools, London. Dr. Maenau, who has proved himself to be an excellent teacher, and also capable of carrying on original research, was very highly recommended by Sir Henry Roscoe and by Professor Emil Fischer, of Würzburg.

NOVELTIES.

PAPER-WEIGHT.—A silver model of the Eiffel Tower stands upon a heavy silver base about four inches square, and is about twelve inches high. By touching a button on the base, the tower collapses and sinks out of sight. By pressing another button, the tower rises gradually until it has attained its full height. As it only rises while the button is being pressed, by taking off the finger, the tower can be arrested at any height desired. It can be used either as an ornament or a paper-weight.

AMONG novelties directly of interest to jewellers and art metalworkers a contemporary mentions some neat designs now being shown in parian ornaments, which stand out in relief on a plush mount covering a few inches of the centre of a 12-inch plaque. The latter is in lacquered brass, stamped in imitation of *repoussé* work.

CONSPICUOUS among art goods in metal which continue to find popular favour are the high-standing parlour lamps, and brass tables and stands with Mexican onyx tops.

SMALL vases which also take the fancy are seen in tall slender urn shapes surmounted with covers, the bodies of the vases being of Sèvres or onyx with gilt handles.

CUT glass goods, variously mounted, are greatly in vogue for wedding presents, dessert sets, berry dishes and similar sets in porcelain and silverware being shown in satin-lined cases. Also, for wedding and birthday gifts and presentation purposes, ice-cream sets and *tête-à-tête* sets are put up in similar cases of handsome design.

SCENT bottles with two sides as willow-pattern plates are another pleasing design; as are some striking vases of Belleek china with elaborate decoration in gold relief and chasing.

SPECIMENS of Japanese production in the design of pottery and similar ware should not escape the attention of artists and manufacturers in this country, some of their highly finished works now in the market bearing evidence of strong originality as well as artistic merit.

Messrs. Mappin & Webb had recently on view at their Cornhill establishment a complete toilet service, including ewer and basin, soap dish and brush tray, in silver plate. This may be a bad sign of the times, looked at from the historical point of view—as indicating the effeminacy and extravagant degeneracy of the classes—but it is to be hoped, in the interests of the silversmith, the taste for such like appointments will become more extended.

Mr. Alderman Phillips, pawnbroker and jeweller, of West Ham, "is one of three gentlemen just selected by the Deptford Radical Association, from amongst whom a candidate for the constituency is to be selected." In reference to this announcement, the *Pawnbrokers' Gazette* says: "May he be the chosen one of the Deptford Radical Association, and, with the good fortune which has attended his municipal life, the future M.P. for Deptford." We trust he may.

Avalite.—At Avala, near Belgrade, quicksilver is abundant, in conjunction with a green-coloured mineral named avalite, the properties of which are still unknown. It is hoped that, amongst other uses, it may be found possible to apply it as a substitute for arsenic as a colouring body, in which event the discovery will prove very valuable, as avalite is said to be free from the poisonous qualities which make the employment of arsenic so dangerous. The mine was discovered by Prof. Klerics, of Belgrade.

Theft of Diamond Rings.—At the Oldham Police Court, last month, a boy named James Giblin was charged with having stolen a case containing six gold and diamond rings and a brooch, valued at £40, from a bag belonging to Mr. H. Bernstein, travelling jeweller, of Cheetham Hill Road, Manchester. On the 7th ult., prosecutor came to Oldham, and engaged the prisoner to carry his bag for him, and whilst on the way to Middleton Junction Station he abstracted the case from the bag. Prisoner sold the brooch for a shilling, and a ring for sixpence. While in the police office he secreted the case containing the rings under a form, where it was afterwards found. The magistrates ordered the prisoner to receive eight strokes with a birch rod.

A poor cultivator paid a visit to Madame V—, his *propriétaire*:—"Good-day, Nicolas," said she to him, "I have heard with sorrow of the death of your wife."—"Ah! do not speak of it, madam; besides, now another great misfortune has come to me."—"What is that?"—"I have lost my poor cow, which has completely ruined me, so that I have been obliged to take my watch to the *Mont de Piété*."—"Oh! you must not despair, Nicolas, you count many friends in your village; they will doubtless come to your assistance."—"What you say is true, madame, my friends love me so much that several have already offered me another wife."—"Really?"—"Yes, but not one of them has offered me another cow nor yet another watch."—*Almanach des Horlogers.*

Failure of a Diamond Merchant.—Under a receiving order made by the High Court, on October 16, against Michael E. Goldstein, diamond merchant, carrying on business in Hatton Garden, a balance-sheet has been submitted which shows liabilities £2,996, with assets £293. From the observations of the Official Receiver it appears that the debtor has been in business for the last eighteen years, and opened his present premises in 1885, when he had a capital of about £2,000. He attributes his insolvency entirely to the loss of his stock of diamonds, value about £4,000, on August 23 last, in a railway journey from Margate to London. The only books he kept, he alleges, were in the bag containing the diamonds, which also included some manufactured jewellery and £60 in cash.

Goldsmiths and Jewellers' Annuity and Asylum Institution.—The 22nd annual dinner in aid of the funds of this institution was held on the 11th ult., at the Holborn Restaurant, Earl Compton, M.P., in the chair. Among those present were Major G. Lambert, President, Major Watherston, Mr. Hughes, Mr. Ford, Dr. Hirsch, the Rev. J. H. Rose, the Hon. Dadabhoi Naoroji, Mr. W. Pierpoint, Mr. J. L. Innocent (Secretary), &c. The toast of "Prosperity to the Institution" was proposed by the chairman, in response to whose appeal a large number of additional subscriptions were promised. In its present state the institution supports 78 annuitants and 20 inmates of the asylum, the outlay for whom amounts to £1,300 per annum. Four-hundred-and-sixty persons have been elected since its establishment, and the invested capital now amounts to nearly £10,000.

The Birmingham Jewellery Trade.—Mr. Colin Clayton, the newly-appointed Mayor of Birmingham, on his appointment referred to the remarkable improvement in the jewellery trade of the city. The last year, he said, had been remarkable as the end of a period in which the trade had been exceedingly progressive. In comparing the returns of the Assay Office between 1879 and 1889, he found that the amount of golds assayed there in the former year was 89,000 ozs., whilst last year it was 170,000 ozs. Of silver there were 167,000 ozs., compared with 906,000 ozs. last year, and the total weight of articles assayed in 1879 was 858,000 ozs., compared with 4,292,000 ozs. last year. That showed a very improved condition of the jewellery trade. Referring to the Railway Rates Bill, his worship pointed out that if Birmingham was to gain any advantage from the opposition to the Bill, they must wake up and be more active.

The Diamond Market.—The state of the *Amsterdam* market has not improved much of late, according to *De Diamant;* foreign buyers have been few, and the dull weather has made purchasers cautious, because an error in the colour of diamonds costs dear. *Rough* and *cleavages* are in good demand.

In *Paris* the sale of finished stones has slightly improved during the month, but there is little movement to note.

Very limited consignments reached London in November at higher prices, so that although numerous dealers were on hand, many went away without buying. Indeed, it is thought that if the rise in prices from the fields continues much longer, the rumour as to a "corner" will have some justification. "Cornering" the diamond market is rather a large order; but, with practically unlimited capital, and in the absence of new sources of supply, it is not without the bounds of possibility.

Silver.—In this market there is no demand, prices remaining nominal at: Bars, 44⅝d.; Mexican dollars, 44d. per oz. respectively.

Board of Trade Returns.

THE clocks and parts thereof imported during October amounted to £42,663, against £50,812 in the same month of last year, £36,891 in the October of 1887. The following shows the sources of the supply:—

	October 1887.	1888.	1889.
From France	£20,049	£21,674	£18,397
„ United States	£6,170	£11,692	£7,818
„ other countries	£10,672	£17,446	£16,448

The ten months of this year give a total of £354,642, in comparison with £370,935 for the same period of last year, and £315,431 for that of 1887.

The watches and parts thereof imported during October valued £53,347. In the same month of last year it was £49,880, and in that of 1887, £65,698. The ten months of this year show a total of £568,631 against £469,052 in the same period of last year, and £604,580 in that of 1887.

The plate and plated and gilt wares exported during the same month are recorded as being of the value of £57,534. In October 1888 it was £44,505, and in the same month of 1887 £40,787. The ten months of this year show a total of £351,184 in comparison with £311,390 in the same period of last year, and £256,341 in that of 1887.

The total value of imports of every kind of produce in October amounted to £38,195,166. The same month of last year it was £35,022,135, and in that of October 1887 £30,550,307. The ten months of this year are credited with the respectable total of £347,985,087, whereas for the same period of last year the figures were £313,635,766. The first ten months of 1887 give the low comparative figures of £294,953,817.

The exports for the month show an increase on the same months of the two previous years, the figures for the Octobers being, 1887, £18,763,201; 1888, £20,893,506, and 1889 £23,000,638. The ten months past give a record of £205,002,351, in comparison with £195,165,048 for the same period of last year, and £181,835,615 for the same months of 1887.

TRADE NOTES

CAST METAL DIES.—To the majority of those who visited the Paris Exhibition the American exhibits of the Gorham Manufacturing Company and the Meriden Britannia Company came as a surprise, the quality of workmanship, elegance of style, and boldness of design being striking characteristics. It will be a further surprise to the majority of our readers to learn that the work is largely contributed to by dies which are cast and not hand-cut. These dies are supplied by the Smith Brothers Manufacturing Company, Passaic, N.J., who, after a series of struggles, have recently succeeded in bringing die-casting to perfection, and their well-merited success is now carefully guarded by patents in the leading countries. As an instance of the magnitude of the work, it may be mentioned that this Company have recently cast a die for the Gorham Company weighing 256lbs., and there is no hindrance to casting very much larger dies if required. The Metallic Art Company, of Glasgow, who control the British and Continental Patents, have also had difficulties to contend with, which they have successfully overcome. They have supplied quite a number of dies up to 60lb. weight, and have found it necessary, in order to meet requirements, to increase their capacity of casting up to 120lb. Whatever tends to decrease cost must be of importance to manufacturers, and here we have an instance of production at a cost not exceeding half that of hand-cut dies, with the certainty that a die with an intricate design can be completely finished within fourteen days. There is a natural prejudice against innovations, and a rooted belief that nothing can equal steel for stamping purposes; this, however, is dispelled by these dies, composed of a metal as hard and tough as steel. The metal and construction of the dies give them an identity which cannot be imitated. By this process these firms also produce fine art casting in bronze, &c.

MESSRS. O. BERENDT AND CO., 61, Fore Street, E.C., have now on their premises and in store a variety of electrical appliances that are well worth the attention of jewellers and fancy dealers trading in novelties. Among the newest and most suitable apparatus to be seen at their offices may be mentioned the pocket accumulators for generating the electric light in small incandescent lamps that may be carried in the button hole, or by ladies in bouquets of flowers or worn in the hair. By these small lights, which are quite safe in every way, very pretty and startling effects can be produced, and, as the accumulators are curved, they adapt themselves to the shape of the body when carried in the pocket. No. 3 D, 4 volts, was pointed out to us as the best for practical purposes; its price is catalogued at 21s., but there are smaller ones of less power at 10s. and 13s. Electric lamps in great variety and adaptability for numerous purposes, we also were shown. What struck us most as being of great usefulness was the "Aladdin" electric watch stand. This is a watch stand containing a permanent battery in which, by pressing a small knob or button, the time can be read at night, a small flood of light illuminating the watch dial and vanishing when the pressure ceases. Other novelties might be noted, but jewellers and others interested are advised to go and see for themselves, or write for the firm's catalogue.

CATALOGUE.—We have received the newly published catalogue of the E. N. Welch Manufacturing Company, of Forestville, Connecticut, manufacturers of American clocks. The catalogue, which is a splendid specimen of typography, contains illustrations of all the latest designs in clocks manufactured by the Company, with a description of each, which, with the exception of the dimensions and references given for ordering, is rendered almost unnecessary by the beautifully executed engravings. Dealers in American clocks should write for this catalogue to Mr. Marples, who is the sole agent for this country.

WE had recently the privilege of inspecting some of the remainder of Messrs. Clémence Frères' exhibits at the Paris Exhibition, for which they had awarded them the silver medal. This award, by the way, is only to be accounted for by reason of the jurors being constrained to give highest honours to those who, so to speak, democratised production by means of new inventions, in the way cheapening processes, etc., which were held to benefit the larger number of purchasers, rather than to high-class workmanship or artistic excellence. Chiefly noticeable among the *chef d'ouvre* we saw were the Album watch, in which the case, opening in concertina fashion, enables several photographs or engravings to be carried, and makes a compact souvenir, useful for a variety of purposes, and when closed a solid case. This case, which is a marvel of case workmanship, was—we are informed—made and designed by one of the brothers Clémence. Another novelty introduced by the firm and exhibited for the first time at the Paris Exhibition, is the *Mémento*, or memoranda watch. This watch has three small dials—one on the left with date, 1st to 31st; one on the right for memoranda, 1st to 31st; and one at six o'clock for the days of the week, with seconds' hand. An appointment having been made, right-hand hand is set accordingly, and when time arrives attention is called to it by a pansy appearing in a space under the twelve o'clock—"that's for remembrance." Bracelet, brooch, and châtelaine watches were also among the remnant not sold yet, and of these bijou watches the most noticeable were those mounted in butterflies, convolvuli, beetles, &c. In these watches a feature of great importance is economy of space, this being secured by the oval movement, which allow of escapements and barrels of larger calibre than would circular movements of the same size, as indicated by the dials. Judging from the sample of the goods we saw, the complete exhibit was well worthy of the high reputation the firm enjoys, as well as being a testimony that the Swiss artists still maintain their cunning in the art of horology, diamond mounting, and enamelling.

THE beautiful key with which Lord George Hamilton opened the door of the Bramley Conservative Club is about seven inches in length. The stem is a richly fluted column, surmounted by an elegantly beaded base and capital. On the front of the "head" are the arms and crest of Lord George Hamilton in brilliant enamels of red, white, and green, encircled by a blue enamelled ribbon, on which is inscribed the family motto, "Sola Nobilitas Virtus," the crest being surmounted by a coronet. On the reverse side of the head is the monogram of the Bramley Conservative Club, "B.C.C.," under which, on a plain but beautifully made shield and garter, is the following inscription:—"To Lord George Hamilton, November 2nd, 1889. Presented by Mr. Thomas Winn, architect, on the occasion of his Lordship opening the Conservative Club, Bramley." The whole is beautified and completed by various ornamentations of most original design, and is indeed a unique specimen of the goldsmith's art, and does great credit to Messrs. Fattorini and Sons, Bradford, who are the designers and makers.

BIRMINGHAM
NEWS

From Our Correspondent.

The state of the jewellery trade here is certainly brisk, a good few of our manufacturers go much further and say awfully busy, and indeed appearances on all sides corroborate the statement. We have a boom in iron and steel, a boom in coal and copper, why not a boom in jewellery? The debateable point is how long will it last? The more sanguine of our craft say "this is a general revival, it will last probably for years; trades all around are busy, and of course we shall have our turn"; on the other hand the croakers—of which there are not a few—screech forth their dismal prophecy "that it will about last till Christmas, if it don't collapse before, and then all the hands that are now being advertised for (though, by-the-bye, they can't be got) will get discharged, and the same chaos of empty benches and long faces will again reign supreme." Well, for my part, I never did like the prophet of modern times, but any way let us be thankful for present mercies. We are all at present rushing about like a series of two-legged whirlwinds, pushing workmen on with this job, hurrying forward that little order that is a long way behind time, and causing a general stir and getting into such a state of excitement as has not been seen in the jewellers' quarter since 1870. Now all this is very nice; of course there is a lot of grumbling going on—can you find me a place on the face of this globe where there is an Englishman and no grumbling?—at orders being behind date, but this is more than compensated for by the cheerful state of mind that we appear to be getting into. It is positively good for the liver. We shall find ourselves richer by the decrease in doctor's bills if this keeps up for another year; so let those old croakers go and get measured for their coffins—they are only walking about to save funeral expenses.

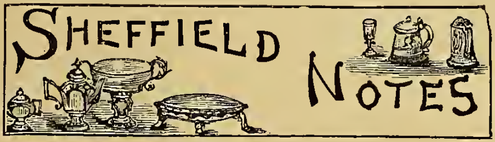
* * *

In consequence of all this "things are on the rise," in other words prices are going up. The stone dealers evidently intend "making hay while the sun shines," and quotations range considerably higher than was the case a month or so ago. Parcels of good pearls are quoted at nearly fifty per cent. more, and indeed any parcel that is asked for suddenly becomes more valuable. This rise in prices is what we have all been hoping would come, and indeed was almost inevitable as the saving point. So let us be careful and not overdo it; don't boom too much or you may boom some of it out of the country. What we want is a steady and firm range of good profitable prices all round, and not a sudden and fabulous increase that will have to come down again and leave us in a more unhealthy state than before.

* * *

The project for placing the Jewellers' Art Classes—now held in Helen Street—in a more central position, which will necessitate the purchase of premises, is of course an interesting feature of the past month, and a considerable amount of discussion has taken place in the trade over the proposal. The premises in question, built by and until lately occupied by Messrs. Randal, are peculiarly adapted in their arrangement for the purpose suggested, and as the Association have the matter in hand, and are, in fact, the promoters of the scheme, I have no doubt that it will be brought to a successful issue, in which case the trade at large will have another boon to thank the Association for. The very fact of an Art School of large dimensions belonging to the trade cannot have any but a salutary effect, as it will tend to give a tone to the quality of Birmingham jewellery, and go a great way towards removing the stigma of "Brummagen" jewellery in the future.

By the time this has gone to press the adjourned meeting of the Association will have taken place for the revision of rules, the details of which will be duly reported in your next issue. As the section of rules for consideration are important ones, it is hoped to get a good attendance, and after which, I suppose, a new "revised draft" will be printed and circulated among members. We should like to add new members at every meeting if possible, in order to increase our numerical strength and funds. This will give a more efficient working power, and must be beneficial to the trade.



From Our Correspondent.

Nothing has conduced more to the exercise of thrift among the artisans of Sheffield than Building Societies. By depositing a few shillings weekly the industrious silversmith had the prospect of a competence when old age came upon him. In point of fact, many such competences have been secured. But as far as appearances go at present, Building Societies seem to have had their day. The collapse of the South Yorkshire, the most seemingly prosperous and well conducted of the lot, has sent ruin into hundreds of comfortable homes. An attempt has been made to make scapegoats of the directors, by holding them responsible for the failure of an unfortunate investment in the Dunraven Colliery. Had this attempt succeeded, the directors would have been mulcted to the tune of, roughly speaking, £130,000. The Law Courts, however, have just decided otherwise, and the last faint hope of saving a remnant of their property has died away in the breasts of the unfortunate shareholders and depositors. The ruin has been widespread, and there are but few Sheffielders who are not connected in some way with victims to the unfortunate undertaking. Following in the wake of the collapse of smaller societies, the failure of the South Yorkshire has had the effect of utterly discrediting such societies in the public estimation.

To the sufferers themselves, the contrast between their own condition and the state of general prosperity which prevails around them must be most striking. The idea will obtrude itself, that had trade been eighteen months ago as it is now, all would have been well. Be that as it may, the tide of prosperity is still flowing. The works at the east end of the town are working to their utmost capacity, and house property, Attercliffe way, is again a marketable commodity. The price of iron and coal is still going up and advances in wages are conceded without a struggle. As it is with the heavy trades so it is with our lighter industries. Cutlers and silversmiths have banished from their faces that look of painful anxiety which obtained two years ago. For all that we have not lost our heads as in the inflated times of 1871, when colliers got drunk on champagne, and the British working man generally thought that he was indispensable. That, however, is the danger which lurks ahead, and is only to be avoided by the exercise of moderation all round.

Last month I chronicled in these notes the installation of a new Master Cutler. Now it falls to my lot to notice the advent of a new Mayor. After two years tenure of office, Mr. Alderman Clegg retires and gives place to Mr. Alderman Jackson. Mr. Clegg, as a teetotaler, was always looked upon as an extreme man, but any anticipations that this peculiarity would mar his usefulness as a mayor have proved groundless; in his capacity as magistrate, he has had to adjudicate on the usual number of drunks and public-house cases generally, but even his bitterest opponents have been constrained to admit that his impartiality has been above question. Mr. Clegg's own anticipations of an uneventful career have been falsified, as early in his term he had to grapple with the small-pox epidemic, which proved so disastrous to the trade of the town while it lasted. His services too in connection with the Trade Marks legislation have been acknowledged on all hands. Altogether Mr. Clegg's mayoralty may be pronounced the most successful we have had for a long time.

The calling of a clockmaker is one which strikes the imagination as having an old-world ring about it. It suggests mediæval towns with their church-steeples and old town halls, and through them by the law of the association of ideas, with things quaint and venerable. Mr. Edwin Rippon, of the Wicker, Sheffield, I look upon as a model clockmaker. How Mr. Rippon can part with any of the clocks he makes I cannot imagine, he seems to love them so. As, however, he has had for many years the sole charge of all the public clocks in Sheffield, I should think that his sense of possession would be amply gratified. One clock—not a public one—he points to with peculiar pride, I suppose because it is a peculiar clock. It is inserted in a niche just within the doorway of his shop, and there it has stood for close upon thirty years. This clock has one full-sized dial in the place where the dial ought to be, and seven smaller ones on a level with the bottom of the pendulum; the top dial shows Greenwich time, and the seven smaller ones the contemporary time at Sheffield, Edinburgh, Dublin, Paris, New York, St. Petersburg, and Calcutta respectively. To work the hands of these seven dials requires no less than forty wheels, all of which are geared together within a circuit of 15 inches diameter. The average clock buyer would perhaps not care to purchase an article like this, but I should think it would make a very desirable adjunct to the show window of any tradesman, and in point of fact, the motto which Mr. Rippon has put over the clock, "*Ad captandum*," clearly indicates the use to which he puts it.

Brass as a metal is near akin to German silver; this is said in no spirit of cynicism. It is simply contended that any piece of art-workmanship executed in brass may fairly claim to be noticed in this journal. This being so, I should like to call attention to a monumental brass, executed by Messrs. Longden & Co., and intended to be placed in Dunfermline Abbey, to the memory of King Robert Bruce. The work differs from the ordinary monumental brass, in being executed with hammer and chisel, and not simply engraved. This gives it a much more substantial appearance, and renders it practically indestructible. The figure of the Scottish king is life size. He is clad in a suit of chain armour, over which he wears his kingly robes, his hands being folded in an attitude of prayer, and his feet resting on the recumbent figure of a lion. A great two-handed sword, 5 ft. in length—and an exact reproduction of his famous weapon—lies by his side. On the left is his coat of arms as King of Scots, and on the right that which he wore as Earl of Carrick. When placed over the grave of the king in the old Abbey, the brass will be inlaid into a slab of rare Egyptian porphyry, 9 ft. 3 in. length by 4 ft. in width. Altogether, the monument which is designed by Mr. W. S. Black, an eminent Edinburgh architect, is most spirited and effective, and is a very fine specimen of Sheffield art workmanship.

The spirit of enterprise which marks the general management of John Round and Son has been further exemplified in the fact that they have just adopted the electric light in their showrooms and offices. Although the lighting of shops in this manner is now becoming quite common, this is the first instance in Sheffield of a manufacturing concern going in for the light of the future. Calling in the other night to have a look round, I was much struck by the pleasing effect of the innovation. The gas fittings were all cleared away, and in their places were suspended incandescent lamps which emitted that clear, steady and noiseless light peculiar to the electric light. The ceiling had been painted in harmonious colours under the evident conviction that no noxious fumes would henceforth obliterate its tasteful ornamentation. But the most obvious advantage of the change appeared to be the fact that the show-cases were as well lit as the centre of the room, lamps being suspended at intervals inside of them. This, of course, would be impossible with gas, so that the most essential feature of the show-room has been much enhanced by the change.

In the course of this visit to Messrs. Round and Son my attention was drawn to the numerous silver trowels for foundation-stone laying purposes which were lying about. In spite of its dearness, the handles in every case were massively composed of carved ivory, and the blades consisted of a variety of very beautiful patterns. As showing how a lucky hit may be made in the working out of a new idea I was shown a new bread fork, the design of Mr. W. H. Rhodes, the manager of that department. This fork is longer, lighter, and at the same time stronger than those hitherto in use, while the outline is so graceful as to attract the eye at once. Here, too, ivory is the material mostly used in making the handles. I was told that these forks had been got up since the travellers had started on their journeys, and that the patterns sent out to them had been snapped up by the shopkeepers to whom they were first shown.

The Annual Meeting of the Council of the School of Art has just been held and the Reports presented by the Head Master and the President, respectively, show the School and its branches to be in a very healthy state. The number of students is greater, and the prizes carried off and certificates gained during the past year show a very satisfactory rate of progress. The town is to be congratulated on these facts, as the development of the silver and electro-plate trades of Sheffield is more owing to the excellency of its School of Art than the general public are at all aware of.

It is satisfactory to note that as the season advances towards Christmas, the optimist anticipations indulged in by silversmiths in the autumn have been fully realised. Managers, upon whom devolve the responsibility of executing orders, are working at high pressure. Running one's eye down the advertising columns of the daily press one cannot help noting the number of men in nearly every branch of the trade that are almost daily advertised for. Everybody seems to have the comfortable assurance that we are safe for this season at any rate.

Midland Jottings.

A "SPECIAL" Circular was issued at the beginning of last month to the Members of the Jewellers and Silversmiths' Association, calling them to a meeting on the 4th, at which very important business would be laid before them. This business referred to further developments in the Jewellers' Art Classes which were mentioned in these Jottings at some length last month. It was a very good meeting, some 35 members being present. It was held in a room at the Assay Office, in Newhall Street, which was far too small for the purpose. Considerable interest was manifested by the members in the subject brought before them, and there were some very good speeches made. Mr. Councillor Charles Green occupied the chair, and he was supported by Messrs. J. M. Banks, E. J. Johnstone, H. Griffith, and J. Wainwright. Among others present were Messrs. L. Spiers, Ginder, Adie, F. Nathan and Councillor Jacobs.

Mr. Councillor Green, in an able and straightforward address, laid before the meeting facts concerning the Art Classes as they were now constituted and as to their foundation, which need not be here recapitulated, as they were fully dealt with in Mr. Parkes's last month's Jottings. He then went on to inform members what steps the Art Classes Sub-committee had taken to extend the usefulness of the movement. In company with Mr. E. Preston Hytch—the courteous Secretary of the School of Art—he visited the handsome premises at 82 and 84, Vittoria Street, belonging to Mr. William Randel, and they were also viewed by an architect on their behalf. The result of this was, that Mr. Preston Hytch wrote to Mr. Green, to say that the Museums and School of Art Committee on the City Council would report that they advise the Council to acquire the premises indicated, and that they authorize the Finance Committee to borrow the money to purchase the building, and to provide fittings, &c.

A day or two after the meeting, Mr. E. R. Taylor, the Head Master of the School of Art, expressed his opinion to your representative, and said that it could not help but be a great success. The Association guarantee a certain number of students to keep the classes going, and at any time, did this number decrease, there would be no difficulty in recruiting from other sources, and so making the classes successful this way. This answers an objection raised by a manufacturer, with whom the writer was discussing the question the other day. He thought it was hardly the thing to tax ratepayers with the cost of providing a school for one section of the community. If, however, the students at the School are guaranteed, this objection is rendered groundless, quite apart from the fact that there are so many advantages to set off against the objection, even it it was a valid one. Jewellery is one of the oldest of Birmingham staple manufactures, and certainly one of the most considerable, and the object of the classes is to "Advance the taste in jewellery and personal adornment."

Mr. Councillor Green said that one of the principal causes of the bad trade of the last decade lay in the fact that Birmingham jewellers, although they knew how to "make," did *not* know how to "imagine." They were good workmen, but poor artists. This state of things had now gone on long enough, and they were going to ask their apprentices to go to the Art Schools until they were 19 years old, and after if they cared to; but on their attendance up to 19 they would insist very strongly, and in order to bring it about more effectually they proposed that stamped forms of indenture, containing a clause relating to the point, should be kept by the Secretary of the Association, so that a master might obtain one at any time for five shillings or so when he had a new apprentice coming to him. Alderman Johnstone stated that it was not his custom to have apprentices at all, but in future all new boys at work at his bench he should require to be apprenticed and to attend the School.

In a very eloquent speech Mr. J. M. Banks said that Birmingham jewellers ought no longer to lie waiting for fashions to come to them, but to invent fashions for themselves. In this way trade would be made better, profits be better, and wages better, and Birmingham would become the centre of the manufacture of jewellery, as it ought to have been all along. He had for many years dreamt of some such movement as this which was now taking place among the jewellers of Birmingham, and now his dream was being realised, his wish consummated.

This report of the Museum and School of Art Committee was presented at the quarterly meeting of the Birmingham City Council on the 9th of November. The report sets forth the whole of the work done and being done, and the Committee strongly urge the Council to sanction the steps they were prepared to take. After some discussion, the report was adopted, and very soon now Birmingham will have a School in which both the artistic and the technical parts of jewellery will be systematically and thoroughly taught. This reflects great credit, not only on the Jewellers and Silversmiths' Association and the Museum and School of Art Committee, but also on the public spirit of the members of the City Council. The occasion is one for very considerable joy on the part of the trade.

A branch of the jewellery trade which is not always taken into account, is that of "gilt jewellery," and this is of no slight importance when one considers the enormous amount of stuff that is turned out by such a firm as Mr. Charles Wilson, of 57, Graham Street. This is a business which has been established nearly half-a-century, and in which the original proprietor and founder (Mr. Wilson) made a fortune. Some five years ago it was purchased by Mr. F. Gibbons, who has been gradually extending it since that time. The writer went over Mr. Gibbons' works the other day, and was surprised to find what a variety of articles are included under the head of gilt jewellery. The manufactory consists of a tool-making shop, for Mr. Gibbons makes all his own tools and dies; a stamping-shop, where the blanks of metal are stamped in dies the shapes they are required. In the press-room, among other things, are made all the small things and fittings which are required for fitting up brooches, scarf-pins, ear-rings, &c. All these little articles are put together in the making-up shops, where they are also soldered together. From here they are sent downstairs to be dipped, and are then electro-plated or gilded as the case may be.

This gilt jewellery has to be sold in very large lines or little would be the profit realised thereon. Thousands of grosses of brooches are always being sent away. One of the most remarkable things to be seen is the "penny brooch," made in a variety of patterns. These things *retail* at a penny, and it is a marvel how they are produced; yet they are produced, and a fair margin of profit is left on them, while the men, women and boys who take part in the making of them earn good wages, and there is nothing whatever to grumble at. Of course, it is very evident that they could not be done at the money, except all the processes of manufacture went on under the same roof. Mr. Gibbons is fortunate in that he has sufficient plant, which enables him to do all this, and he is thus in a position to turn the thing out at first cost.

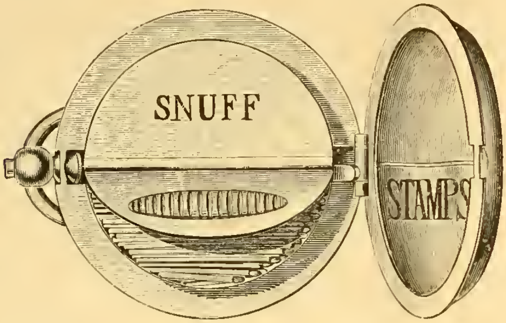
It would be impossible to enumerate all the various patterns and designs in brooches, pins, earrings, keeper and wedding rings, which are to be seen in the warehouse, but their number is legion. The writer saw a very good looking brooch in gilt, with a paste diamond, which was sold at 30/- per gross; this pattern has been registered and has a good sale, as well as the gilt and electro-plated articles; the French oxydized silver is being copied, and some remarkably pretty things in this way are being produced by Mr. Gibbons. This branch of the Jewellery Trade is rather a remote one from that portion of it which devotes itself to the production of elegant and costly single pieces in gold and jewels, but it is none the less important in its way, for we have to consider the thousands and thousands of peoples of different kinds and races to whom the stuff goes. Where one single costly piece is sold, a hundred gross of gilt jewellery would be ordered.

A word of explanation is necessary in reference to a paragraph in Mr. Parkes's Jottings last month in regard to Mr. J. W. Tonks and the Paris Exhibition awards. Although Mr. Tonks was appointed to sit on the jury as an expert in Class 24, the appointment was made so late that when he opened the question with the chairman, he was told that their decisions had been practically arrived at, consequently Mr. Tonks cannot be said to have really acted at all in this Class.

At the annual meeting of the City Council, held on the 9th ult., Mr. Alderman and Councillor Chas. J. Hill, watch manufacturer, of Russell House, Coventry, was elected Mayor of Coventry for the ensuing year. Alderman Gulson, who nominated the new mayor, in his proposing speech referred gracefully and eloquently to the many qualifications of Mr. Hill for the dignified office and to his past services rendered to the town. Alderman Maycock seconded the proposition. The new Mayor, being duly installed, suitably, and with becoming diffidence, acknowledged the compliment done him, and after the ex-mayor, Mr. Alderman Tomson, had responded to vote of thanks, which was enthusiastically accorded him by the Council, the proceedings were brought to a close by the election of five aldermen in the place of the like number retiring. Mr. Hill is well-known to many of our readers, and, in wishing him a long and prosperous term of office, we shall be joined by a large portion of the trade of which he is a respected member.

Mr. Jno. Skinner, of Vittoria St., Birmingham, has registered an unique design for a combined paper weight and letter seal. This is a bust of the late John Bright, formed by the electrodeposition process. It is a perfect likeness and beautifully modelled, standing about four inches high, and is sure to be in strong demand among admirers of the great statesman and orator.

Under the title "Eclipse" (registered No. 133,637), Messrs. C. Timings & Son, of Spencer Street, Birmingham, have placed upon the market another novelty on the lines of their well-known collapsible drinking cup, as an adjunct to the "Albert" chain. Like the drinking cup this combination is contained in a watch case, but it has doubtless a greater popularity than was accorded the former, for whereas the drinking cup is only useful to travellers and tourists, the "Eclipse" combination will be useful to all and on all occasions. The receptacles in the box are for matches and snuff (for which might be substituted smokers' requisites in the shape of cachous, &c.) The cover contains pockets for stamps and railway ticket. The accompanying cut renders a further description unnecessary, but it may be added that the cases are made in metals, to resemble gold and silver, and are warranted to keep their colour and wear through alike. Dealers who have handled Messrs. Timing's goods will not require a warranty.



Corroborative of our remarks in these Jottings of last month, is the fact that at the Birmingham Assay Office they are so busy that they have to employ extra hands to get through the work. Where formerly two clerks were found to be amply sufficient for the work in hand, a dozen are now employed, who working at high pressure, can barely keep pace with the quantity of manufactured stuff sent in for assaying and hall-marking.

The Coventry Market Hall Clock is credited with a recent remarkable time-keeping performance. Mr. E. T. Loseby, the maker of the clock, has sent in the following statement, being the result of comparisons made by noting the first movement of Greenwich 1 o'clock electric signals and the first sound of the bell at the foot of the tower, from October 26th to November 16th :—

1889.		Clock on Signal. s.	Daily differences. s.
October	26	Slow 0·8	0·0
	28	„ 0·0	0·4
	29	„ 0·0	0·0
	30	„ 0·0	0·0
	31	„ 0·0	0·0
November	1	Fast 0·2	0·2
	2	„ 0·2	0.0
	4	„ 0·4	0·1
	*5	„ 1·0	0·6
	6	„ 0·8	0.2
	7	„ 0·7	0·1
	8	„ 0·8	0·1
	9	„ 0·6	0·2
	11	„ 0·2	0.2
	12	„ 0·0	0.0
	13	„ 0·0	0.0
	14	„ 0·0	0·0
	15	„ 0·0	0·0
	16	„ 0·0	0·0

* On this day, November 5, a regulating weight, equal to ¼ sec. was taken off the pendulum, no other alteration of the time or regulation having been made throughout the three weeks

Silver Counterfeits.

THERE is (says the *Engineer*) good reason to believe that there is at present a considerable number of spurious half-crowns in circulation in Great Britain, for which we are indebted to German commercial enterprise. These coins have nothing in common with the base metal imitations of the vulgar coiner; on the contrary, they are equal in quality to the half-crowns issued from Her Majesty's Mint. They are not cast, but stamped in proper coining machinery from excellent dies. They are of full weight; indeed, the only difference between them and the English coin, is that the German coin is a minute fraction of an inch larger in diameter and slightly thinner. At first sight it would seem that the export to England of such coins would not pay: the contrary, however, is the fact, and there is no doubt that a very large profit is made. It seems a profit of 6d. can be made on each coin. The worst of the affair is that it seems to be impossible to stop the importation. So difficult is it to detect the difference between the English and the German coin that the Goldsmiths' Company have, we are told, pronounced genuine half-crowns which the Mint authorities assert they never issued. Up to the present very little has been said by the authorities for obvious reasons: but the Goldsmiths' Company are, it is understood, consulting as to the best steps to be taken to meet the difficulty.

In reference to the above, Mr. Ralph Heaton, jun., says the curious thing about the counterfeit coin is that they are absolutely made of a better quality metal than the real ones. The Royal Mint, he adds, cannot find out where these coins are being made. There is no warrant for assuming that they are made in Germany. They may come from England, Germany, or Spain, or may even be made on board ship. An astute speculator, some time back, established a whole coining plant on board ship, and here turned out base sovereigns at his own sweet will. Even he, though, had a difficulty in getting them into the country, and Mr. Heaton sees almost insuperable difficulties in the way of getting these foreign half-crowns through the Custom House. The examination of goods is now so searching that, in consequence of the possibility of smuggling dynamite, it would seem to be impossible to get the money through. Again, he points out that in England the manufacture of such coins would be attended with many dangers. In the first place, large quantities of silver would be wanted, and it would be easy to trace where it was all going to. Then extensive and costly plant would be required, since the coins are not cast, but rolled and stamped precisely as in the Mint. The risk, too, for an English firm is so great, for on detection the penalty would be sure to be little short of ten years' penal servitude. Looking at these facts, he is inclined to the belief that the coins are of foreign manufacture, and that they are smuggled in by some means. He himself had been made aware, through the Royal Mint, that these false coins were in circulation for some six months past. The detection of the coins is almost impossible. As Mr. Heaton points out, the Mint have no private mark, and the manufacturers, whoever they are, are shrewd enough to keep the spurious coins as near as possible to the standard of specific gravity and weight of the genuine one. The Bank of England was the first to discover that the counterfeit coins were in circulation, but even they cannot say how they tell them. They allege that they can "smell" them. This method of swindling the revenue is an entirely new thing, and has only been possible since the price of silver fell so greatly. When silver was at 5s. an ounce it would not pay. The Royal Mint are, it is understood, making inquiries into the source of the spurious coins.

At Gateshead on Thursday, the 27th ult., a tramcar ran off the lines and dashed into a jeweller's shop, doing considerable damage, and so seriously injuring one of the assistants, that his leg had to be amputated.

Paris Exhibition, 1889.

Artisan's Report to the Mansion House Committee.

Designing and Engraving.

By James W. Jenkins.

THE Paris Exhibition of 1889 can fairly claim to have brought together a splendid collection of art-work in gold and silver. The sections containing those exhibits are among the most interesting in the whole exhibition, partly owing to the general attractiveness of the display, but more especially on account of the artistic character of the designs, and the high degree of excellence in the workmanship.

A close inspection of the jewellery and silver plate exhibits soon impresses one with the fact that the gold and silver trades of France possess art-workers of considerable ability, who spare no pains in their efforts to produce real works of art.

The exhibits of French firms are very numerous, while those of the English are almost conspicuous by their absence. This is much to be regretted, as a good collection of English gold and silver work might easily have been got together, which would have done considerable credit to our manufacturers, and at least have made a comparison with foreign work possible. As it is, there are only four or five exhibits of English gold and silver work, which, though excellent of their kind, do not give a fair idea of what can be done in our own country. Speaking generally, it may be said that English gold and silver workers have much to learn from their fellow-workmen in France, especially in regard to the painstaking care which is bestowed upon minute detail. Nearly every piece of French gold work in the Exhibition is made and decorated with an amount of careful finish such as is seldom seen in London work of a similar character. There are chatelains of rich designs, with every part exquisitely carved, the scroll work especially being very graceful and free. Orchids, pansies, marguerites, forget-me-nots, violets and trefoils in gold and coloured enamels are very plentiful, as are also butterflies and horseflies, the latter being mostly set with precious stones. These flower designs are so well known to English jewellers that a detailed description of them is unnecessary.

In the silversmiths' court of the French section many beautiful examples of fine-art work are to be seen. Silver caskets, epergnes, trophies, and cups, many of which are exceptionally large, are embossed with very artistic designs, figure subjects being especially good. Modelled figures and animals are also extensively used. Tea sets, flagons, &c., are invariably embossed in high or low relief, and not ornamentally engraved. Neither trundled ornament nor bright cutting is to be seen anywhere in the French exhibits. Wherever there is engraving it is all pure graver work, freely and soundly cut. Articles with flat surfaces, such as salvers, boxes, and trays, are engraved, and in most instances with elaborate and superb designs. One design on a salver consisted of a medallion in the centre, with a frame or border about one-and-a-half inches from the edge, between which and the medallion was an elaborate Renaissance ornament, with large griffins and scrolls, the part beyond the border being filled up with laurel and corner pieces. Every part was cut with the graver, and the whole effect considerably heightened by the surface being oxydized, and afterwards partially polished in such a way as to leave the oxydization visible only against the outline, which gave the design the appearance of being raised above the groundwork. This method of oxydizing silver work is very general; in fact, it is a rare thing to see French silver work polished bright. Some smaller articles, such as card trays and snuff boxes, were perfect gems in regard to the quality of the engraving on them. Pastoral groups of figures, dances, drawing-room scenes, processions, tributes to beauty, and other subjects were finely and exquisitely engraved, and the same method of oxydizing adopted, but with still more effective results, for in these examples the shadows were more or less oxydized according to the tones required by the subject. This process of oxydizing is an important matter, and deserves to be more generally used by English silver workers than has hitherto been done. The surface produced by it is the one which shows modelling, chasing, and engraving to the best advantage, and engravers especially would do well to urge its adoption for their more important pieces of work, as by its use a piece of engraving, such as architecture, a group of figures, or a landscape, can be tinted in such a manner as to have many of the various tones of a monochrome painting added to it.

When large surfaces of bright silver are engraved in line, the effect of the work is to a great extent lost on account of the bright glare of the metal; this may have been partly the reason why "trundled and bright cut" ornament was used as a means of obtaining a more striking effect. Unfortunately for silver engraving as an art this trundled work has been for the last few years so largely adopted in the decoration of silver work, that line-engraved ornament is now rarely practised. Anyone who studies the engraved silver in the French section of the Exhibition must be struck with its immense superiority to that usually done in our own country.

There are, no doubt, English engravers capable of equalling the French work, if shopkeepers and manufacturers could only persuade their customers to buy articles artistically decorated instead of their being contented to purchase common ill-paid work, which is degrading to the worker, and unsatisfactory to the purchaser. These remarks apply with equal force to chasers and embossers, as well as to all those whose work consists in decorating useful articles. There have been clever repoussé workers in London who have received so little encouragement to do good work on account of the demand for inferior, that they have been obliged to go abroad to countries where their ability could be better appreciated and paid better accordingly.

It seems strange that, with an art-loving public and so many successful picture exhibitions always on hand, silver work should not have become a more universal medium for the expression of artistic taste. There can be little doubt that many art-workers have preferred to devote themselves to the pictorial art, where the prospect of having works exhibited in public galleries at least gives the chance of gaining public notice. Until quite recently there was no annual exhibition where works of art, other than pictures or sculpture, could be exhibited, and where the artist in metal or any other material could place his work before the public and enjoy the same chance of receiving the attention and appreciation which had hitherto been monopolized by the pictorial artist. Thanks to the Arts and Crafts Exhibition Society, there will now be an opportunity for gold and silver workers to exhibit their productions at an exhibition which it is intended shall be held every autumn. Its distinguishing characteristic will be the exhibition of all work under the name or names of the designer or responsible executant. The name of the employer, or firm of employers, may also be given. An exhibition of this kind ought to stimulate the workers in gold and silver to greater efforts to attain perfection, and should also create, on the part of the public, a demand for better and more artistic work than it is at present disposed to encourage.

Returning to the French exhibits, special mention must be made of the designs in spoon and fork handles, many of which are much more elaborate than is usual in such work. One Parisian firm shows scores of special patterns, all unique in design, and exquisitely finished. In some of them a monogram is pierced through the head of the spoon, having a carefully carved scroll framework around the monogram, which blends with the ornament in the stem; in others a monogram or cipher is delicately carved or mounted on, or in some instances is merely engraved on the flat, but with more than ordinary care. In all these designs the bowls and prongs are considered as the tops of the spoons and forks, instead of the reverse, as with us; and here also the surface is usually oxydized. It is a question, though, whether it is worth while to oxydize articles of this description, which come in for so much friction through constant cleaning. Another point of contrast between French and English styles was observable in kettles, in which the former provide two spouts, one on each side, by which means the kettle becomes accessible for use from both sides of the table. Several trays were engraved all over with groups of flowers, birds in nests, and other subjects, treated in a manner which showed the engraver's sympathy with the works of nature. In some instances no outline whatever was engraved, the whole effect being produced by shading; the lines in the darker places having been re-entered with the graver. There was very little heraldic work to be seen, for the obvious reason that, most of the exhibits being new articles, they cannot be heraldically engraved until after they are purchased.

The French are particularly good at monograms, of which there are several collections in the exhibition. When pierced and carved, they are invariably finished with the utmost care in every detail. Two exhibitors had taken the whole alphabet with which to form a monogram, the result in each case being a very ingenious design.

A few examples of book-plate engraving were shown, the heraldic specimens of which were very similar to the same class of work done in London. Trade bill-heads and menu cards are in many instances designed and engraved with more than the ordinary thought and attention usually given to such work, some of the specimens being very refined and artistic.

The ivory engravings were only few; but here again a high standard of work was attained, some of the examples being very remarkable for the cleanness of the cutting, without any raggedness showing along the lines.

The working hours of the French engravers vary in different shops, just as they do in England; and there is a good deal of irregularity also in the number of days they work, so that it is difficult to get at the average number of working hours per week. The tools of the English and French engravers are very similar, but the latter make a more general use of the eye-glass. As an example of the care which the French bestow upon comparatively unimportant work, it may be mentioned that monograms of five or six letters on tea-spoons are frequently cut "open" and with a great deal of accuracy. One of the methods employed by them in preparing the surface of gold and silver to draw upon is to dab it with gamboge and a little moisture, which quickly dries and gives an easy surface to take the black-lead pencil. This method is a useful one in cases where work has to be hurriedly drawn in and submitted before engraving, and it is one which is not easily rubbed off.

The wages question is not an easy one to deal with, the prices paid for the different qualities of work varying so much that the mention here of only a few of the Paris prices might be very misleading.

There is evidently a disinclination on the part of Paris engravers to allow their work to be inspected by foreigners of the same trade. I made application to two of the leading engravers in Paris, asking for permission to view their work and workshops, but neither of them would grant the least favour in that direction, although, in one case, I had an introduction through a talented English designer who had worked for the firm, and who had been on the most friendly terms with the employer. I had an interview with the vice-president and secretary of a Paris Engravers' Society, and both gentlemen promised to appoint another meeting for the purpose of giving me such information as I desired, but neither of them kept the promise. On returning to London I wrote twice to the secretary asking for replies to a few trade questions, but up to the present time no information has been received. At the Labour Exchange of Paris I obtained the address of another engraver, to whom I similarly applied, but without success. A manufacturing silversmith allowed me to make an inspection of his workshops, but the machinery and appliances there were of the ordinary kind to be found in London, and therefore do not need description.

The term of apprenticeship in Paris is only three or four years, and it has many advantages over the seven years' apprenticeship in this country. It frequently happens that a boy who is bound for seven years does not take the least trouble to learn his trade until the last year or two of the term is at hand. Under a three or four years' system he would be much more likely to feel that he has no time to waste, and that he must be diligent from the commencement of his service. It also frequently happens that an apprentice, after two or three years' service, finds that he has no liking for the trade he is learning, and is anxious to change it for another, in which he might distinguish himself, but under the seven years' system he does not have the chance of making the change. On the other hand, a master sometimes finds his apprentice a source of great trouble and annoyance to him, and yet is obliged to keep to the terms of his agreement, which, in the case of a seven years' apprenticeship, is a much more serious matter than in one of only three or four years. The seven years' apprenticeship had its origin in a time when scholastic education was not easily within the reach of those who formed the artizan class, and for whom a seven years' term may have been necessary; but under the present improved system of education it may reasonably be urged that boys are more intelligent and can learn a trade more rapidly than formerly, and that a shorter term, say three or four years, might with advantage be substituted for the ancient seven years' term.

The Italian section contains several exhibits of gold jewellery, but only of an ordinary kind, being mainly made up of galleries, bead-wire, and grains. A wheat-ear of diamonds and threads of gold was the only special design.

The Danish section has only a few exhibits of gold and silver, but amongst them is a beautifully chased silver shield, thirty inches high, representing scenes in the history of Valdemar the Victorious. In the centre is a large medallion, containing a battle scene; while numerous other groups of an allegorical character fill up the rest of the shield. It is a highly artistic piece of work, executed by a member of the Copenhagen Academy of Fine Arts, and the price set down for it is 65,000 francs (£2,600).

The gold and silver exhibits of Spain are mostly decorated with niello-work. The jewellery is made in very simple forms, brooches being usually circular or oval, and covered with an Arabesque or Renaissance ornament. Many of the scarf-pins are models of swords with ornamental hilts. Watch-backs are also ornamented with niello-work, some of which is very black.

The Portuguese and Greek sections do not contain anything in gold or silver.

The Norwegian jewellery is chiefly remarkable for its combinations of filagree work and coloured enamels, which are also used for larger work, such as epergnes, flagons, &c. Here are to be seen several sets of apostle spoons, quite spoilt by the exceeding crude engraving in the bowls.

The United States section contains some good examples of work, the designs being in most instances very original. Amongst the jewellery are several elaborately enamelled orchids and pansies, some of the former being particularly fine models of rare varieties of that flower. In the silver plate exhibits nearly the whole of the decoration is produced by chasing and modelling, much of which is of a very bold and elaborate character. Here, again, all such work is finished with an oxydised surface. An important piece of work is shown by a New York firm; it is known as the "Century Vase," designed to commemorate the centenary of the United States Republic. It is four feet two inches high, and five feet four inches long, and contains several groups of modelled figures, and a profusion of rich ornament. The figures are not of that high artistic character which is found in some of the French work, but, taken as a whole, it is a very fine example of silver art-work. The design represents "the native inhabitant of America, the early settler, and that fertility of soil which has been the foundation of national wealth and prosperity: the thirteen infant states, whose political destinies in war and peace were guided and shaped by the genius of a Washington; whose beginnings in science, diplomacy, and mechanical arts were dignified in the career of a Franklin—expanded into thirty-eight, all resting as a unit on an immovable foundation. These it has traced through the vicissitudes of war and peace, which it indicates by symbols of progress in science, in the useful arts, and in manufacturing enterprises: the whole culminating in an expression of goodwill to all, and an invitation to all quarters of the world to display their products in friendly competition."

What little engraving there is in the American section is only to be found in electro-plate work, where it is of the coarsest and commonest kind, mostly of the " trundled " order.

In the foregoing I have endeavoured to describe what appeared to me to be the most important points in design and engraving to be found in the exhibition. The general impression made upon me there, as well as by the work to be seen in the jewellers' and silversmiths' shop windows in Paris, was that French engravers, especially, are more artistic in their work than English engravers. An inquiry into the reason of this is of great importance. Paris is, of course, plentifully supplied with art museums and schools of art. So is London also; from which it is to be inferred that the Parisian workman enjoys some other advantage not possessed by the Londoner. It seems not unlikely that that advantage consists in the facilities which the Parisian workman enjoys of being able to study art in the museums and national art collections on Sundays. Engravers in London are certainly handicapped against their fellow-workmen in Paris in that respect. Our national museums and art collections, especially the art libraries, contain valuable materials for study by engravers, who can seldom have access to them under the present regulations as to opening. If a London workman wishes to study art in the South Kensington Art Library, for instance, he probably has to make a long journey, after a hard day's work, to get to it, and can then only spend a few minutes there before closing time; after which he may have to journey across London again to reach his home. I have known several instances w ere these difficulties have been experienced. If, instead of so much trouble and expense for so little result, the English workmen could study the art collections on Sunday, in the hours which are now too frequently spent in enforced idleness, he would have a far better chance of improving his taste and skill, and of more successfully competing with his French neighbour.

The Prud'homme, or Court of Arbitration, is an institution which plays a conspicuous part in the settlement of questions arising between employers and workmen in Paris. Whether it is much appealed to or not by designers or engravers I am unable to say, but it may not be out of place here to give a brief description of its constitution and functions. There are eighty members of the Court, divided into twelve sections, half of whom are employers and half bonâ fide workmen. The sections are made up of the representatives of four or six of those trades which are more or less connected with each other, so that they may the better understand the technicalities of the trades they have to deal with in the cases brought before them. There are usually seven to form a tribunal, and these tribunals sit at stated times to advise in matters of dispute in such trades as they themselves represent. An employer having a complaint against his workman, or a workman with a grievance against his employer, can go to this Court, and, for a small fee—only a few pence—can have the matter argued out before a tribunal of experts connected with his own and similar trades. The decision is usually accepted, but if applicants are not satisfied they can appeal to a magistrate, who usually acts upon the recommendation of the tribunal. It is certainly a great advantage to a working community to be able to appeal to a Court of Arbitration of this description for the settlement of petty disputes such as are always occurring, without having to pay heavy fees for the privilege.

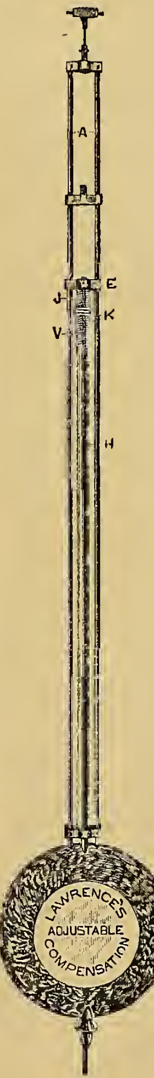
A more detailed account of some of the designs in the Exhibition would have been possible if sketching had been permitted. This, however, is regarded as a serious offence, and even note-taking is not allowed.

In conclusion, I am glad to be able to testify to the courteous and kindly reception given to the London artizans during their visit to Paris by the officials of the British Commission and the Municipality of Paris. The cordial welcome given them by Sir Polydore de Keyser, and the generous hospitality displayed by him, were greatly appreciated. The President and Council of the Municipality of Paris, to whom they had the honour of being introduced, were also most hearty in their welcome, and showed that they were desirous of doing all they could towards cementing that friendship which happily exists between the people of England and France.

The Lawrence Pendulum.

DESCRIBING the above, the inventor (Mr. Alvin Lawrence, of Lowell, Massachusetts), says:—

In the accompanying cut is shown a very fair representation of the zinc and steel compensation pendulum patented by me January 15, 1889, one of which I have had running in my regulator for more than a year. I saw the want of some mode of compensation and *means* of adjusting the same less crude and primitive than then in use; that is, a pendulum in which the compensation could be readily and easily altered, or brought to adjustment, and at the same time, be neat, strong and durable.



The mercurial compensation can be changed without a great amount of trouble, but the clock is always thrown badly out of time on account of the centre of gravity being much changed, and consequently the centre of oscillation. The mercury is a poor compensator, as the height of column is not over one-fifth the length of the rod, from which fact it may be seen that unless the temperature is uniform from *nut* to *spring*, there is both too much and too little mercury according to conditions, and these conditions cannot be practically remedied in pendulums for general use. The consequence is that all pendulums in which the compensation is confined to a small portion of the entire length of the rod, are a constant source of trouble to those using them. There are but two kinds or styles of compensation pendulums that we can settle upon with any great degree of satisfaction, and they are the so-called gridiron one, composed of four brass and fine steel rods, and the zinc and steel one composed of three rods steel and two of zinc, or a tube of zinc instead of the two zinc rods, as invented by Thomas Reid a century ago.

All others are but modifications of these, and are faulty either mechanically or scientifically, as the reader may see, if he will give the subject as much examination as I have. Mr. Reid lamented that there was no means of adjusting his pendulum " without taking it from its place," and not then except by " shortening the tube from time to time, according as the excess of its compensation is shown." He further says that " something might be contrived to adjust it, but that would be too complicated, so that the shortening of the tube by degrees is rather the better way." Now, my patented adjusting device is just what Mr. Reid was wishing for, and had it been known at that time, I venture to say, there would not have been a clock at the present day of any reputation unless fitted with a pendulum constructed on that principle. The following is a brief description of my improved pendulum: The form is a modification of Reid's as shown in the cut. The two rods *AA* are pinned into cross pieces at the top and bottom, the lower ends extending below the lower cross piece, and loosely into the bob to serve as a guide to prevent the bob from twisting out of its plane of oscillation.

A piece of steel is fitted into the upper cross piece to which the suspension spring is attached in the usual way; preferably the spring is formed of two pieces of fine watch spring a little distance apart. Upon the lower cross piece rests the zinc tube *H*, and the steel rod having the bob and regulating nut upon it extends up through the lower cross piece and entirely through the tube *H* and is pinned into the cross piece *E*. This piece keeps the upper end of the centre rod and tube steady and from turning, and is free to slide on rods *A A*. A screw thread is formed on tube *H* at its upper end extending about three inches, as shown in cut, and this screw is slotted or split down its entire length and completely through; the slot being about a tenth-of-an-inch wide. The centre rod is also split in a similar way, and a piece of steel fitted into the slotted rod and secured firmly. The width of this piece is just equal to the diameter of the tube *H*, and may be seen extending through slot *J* marked *V*. A nut *K* engages the thread on the tube *H* and also the thread formed on the edge of the steel pin or piece fitted into the centre rod.

This thin steel piece does not extend quite to the bottom of the slot *V* in the tube, and tube *H* does not extend quite to cross piece *E*. The nut *K* being moved along the thread upon the tube *H* and enlarged part of the centre rod or pin to which the pendulum bob is attached, readily changes that portion of the length of the tube, and to an equal degree, and in the same direction the length of the suspended portion of the centre rod, thereby changing the ratio of the length and consequently of the degree of expansion and contraction of the two metals. The nut *K* is only one-fourth of an ounce in weight, and altering its position makes but a very trifling difference in the rating. Its bearings upon the steel and zinc are solid and even. A square thread ten per inch is employed, and consists of only one complete thread in the nut. This is done to guard against any shifting of the point of support on the tube by expansion and contraction. The square thread is employed for a like reason. The expansion and contraction of the zinc tube in the nut, if a V thread was used, would cause a raising or lowering of the centre rod and bob which is certainly not desirable. The bob is suspended at its centre, resting upon a short zinc tube whose expansion is about equal to the length of steel rod between the regulating nut and lower cross piece. This is to compensate that part of the rod when conditions demand it.

The scientific reader will now see that there is no point overlooked to make this combination as perfect as possible. The compensating metal is so distributed as to provide for every emergency in a more complete manner than in any other pendulum, and by simply turning the adjusting nut in the proper direction, as observation will show, every pendulum can be perfectly adjusted by any one of common intelligence. The performances of these pendulums fully warrant my statement. There are doubtless many who will disagree with me in the matter. To the younger portion I have only to say "live and learn;" to the older, that they are "never too old to learn," providing they were ever old enough.

I have now eight of these pendulums in operation, two of them displacing mercurial ones of the finest make in this country. One at the American Waltham Watch Factory showing an extremely fine rating under very unfavourable conditions, being located in the fourth storey of the factory where the vibrations of the building are great and variable. One at Nelson H. Brown's, No. 90, Franklin Street, Boston, applied to a Seth Thomas No. 10 Regulator, has shown remarkably fine running. I mention these parties as they are easily found and may be relied upon for truth in the matter.

Watchmakers, as a rule, have regulators that are inferior as time-keepers to the watches they undertake to rate or regulate. Such a condition of things is only a constant annoyance to all parties concerned, and the sooner watchmakers come up to the requirements of these almost exact railroading times, the better for themselves and customers. The old wooden rod days are gone by—"*sic transit gloria mundi.*"

The clock at the Waltham Watch Factory, in charge of Mr. James N. Hammond, "was only out one and nine-tenths seconds for the month of July," as shown from observations by the Company's timekeeper, Mr. Bates, a gentleman of undoubted veracity. The instrument used was made by the late Alvan Clark, costing nearly five thousand dollars, and is no sick transit.

To Dealers in Swiss Watches.

THE following circular has been issued by the Committee of the Society of Watch Manufacturers of Chaux-de-Fonds:—

Dear Sir,—We beg to acquaint you with the fact that a considerable increase in the cost of watch manufacturing has taken place during this year. Of late years, prices have fallen to such an extent that neither makers nor workmen could earn a decent living. This state of affairs was mostly due to the stagnation of business which has so long prevailed in the watch trade. Since the beginning of the present year, however, business has returned to its normal state, and the production of watches is now scarcely sufficient to meet the numerous orders coming in, a fact which the manufacturers are naturally glad to witness. These two reasons combined (*i.e.*, the unremunerative prices and the increased demand) have caused a well justified advance in the prices paid for rough movements and workmanship, thus altering considerably the cost of production. We have therefore thought it advisable to inform you of these circumstances in order to enable you to take such measures as you may think proper, for the purpose of raising the actual prices of watches, largely if possible. This general advance is extending over the whole Swiss watch making industry. It imposes itself as an absolute necessity, and we have no doubt that it will be accepted by all those interested in the trade, considering the serious reasons explained and the better state of business in most countries where watches are exported to.

Hoping that you will give your kind attention to the foregoing,

We remain, dear Sir, yours most obediently,

For the Societe des fabricants d'horlogerie
de La Chaux-de-Fonds:
THE COMMITTEE.

The Aneroid Barometer:

Its Various Forms, its Theory and its Use, with Special Reference to the Determination of Altitudes.

By E. A. Gieseler, C.E.

Communicated to the "Journal of the Franklin Institute."

I. GENERAL DISCUSSION.

THE motor of all aneroids consists in an hermetically sealed box, the air of which has been exhausted as completely as practicable, and the flexible sides of which will consequently perform certain motions, when the pressure of the atmosphere changes. These motions are, however, too small to be perceived by the unaided eye, and they are, therefore, transmittted to a suitable mechanism, by means of which they are magnified to such an extent that they can be discerned and measured.

The invention of the aneroid dates back to the beginning of this century, one of the oldest forms being the one constructed by Bourdon, in which the box has the shape of a tube sealed at both ends, and bent into the shape of a circle. A small open space remains between the two ends, and diametrically opposite this gap the tube is fastened to a supporting plate. The cross-section of this tube is either rectangular or oval, and the direction of its greatest height or diameter at right angles to the plane of the circle into which the tube has been bent, which is parallel to the supporting plate.

When compressed air or steam is admitted into such a tube, the inner pressure thus created will have the tendency to straighten it, on account of the excess of pressure exercised on the *greater* area of the *outer* circle side as compared with the *smaller* area of the *inner* circular side. Any increase of the inner pressure will result in a further flattening of the circle into which the tube has been bent, while a decrease of it will cause such curve to be sharpened.

Precisely the reverse will take place when the tube has been exhausted, because then the acting force, instead of being an *inside* pressure, will be an *outside* pressure of the atmosphere. The tube being held as described before at one point only, which is situated diametrically opposite the opening between the two ends, it is evident that the changes of form of the curve must result in movements of these ends; under the influence of high atmospheric pressure they will approach each other, while a decrease of pressure will widen the gap between them. The movements of the ends are transmitted by a simple arrangement to a hand pointing on a graduated dial. They are magnified either by levers acting on the *short* arm of the hand or pointer, or, when the latter is mounted centrally, by means of a toothed wheel and pinion.

This form of the aneroid has nowadays been entirely superseded by others, in which the vacuum box has the shape of a flat cylinder, into the upper and lower circular ends of which concentric grooves are pressed in order to equalise the motions performed by them under the influence of the varying atmospheric pressure. To the side of the vacuum box is soldered a small tin pipe, through which the air is exhausted. After this has been done the pipe is sealed and the upper and lower ends of the box are now deflected towards its interior by the pressure of the atmosphere, the amount of such deflections for a given pressure being dependent on the strength of the plates. This must be sufficient to prevent too great a departure from the horizontal positions, in order not to strain the plates beyond their limit of elasticity. The movements are, therefore, necessarily small; a fall of $\frac{1}{100}$ of an inch in the mercurial barometer corresponding to an approach of about $\frac{1}{20000}$ of an inch of the plates of the vacuum chamber.

II. THE NAUDET ANEROID.

To measure such exceedingly small quantities, one class of modern aneroids is provided with an ingenious mechanism invented by Vidi and later improved by Naudet, the main parts of which are shown in *Fig.* 1.

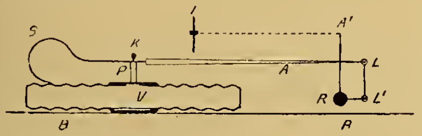


Fig. 1.

To the base or foundation plate *B B* are firmly attached a laminated spring *S* and the vacuum chamber *V*. The latter carries upon its centre an upright pillar *P*, which passes through an opening in the spring and presses on its upper side by means of the knife edge *K*. An elastic system is in this way formed by vacuum chamber and spring, and the pulsations of the former will be imparted to the latter. The horizontal arm *A* is firmly attached to the spring and will therefore follow its movements. These will appear in a magnified scale at the end *L* and are transmitted by the two links *L* and *L′* to the rocker shaft *R*, which turns in bearings attached to the base plate, but not shown in the diagram. The turning motions of *R* are further magnified by the arm *A′* and thence transmitted by a small chain *C* to the central shaft *I*, which carries the index pointer. The required tension on the chain is produced by a spiral spring acting on the central shaft. This spring and the bearings for the central shaft are not shown in the diagram.

The graduation of the dial on which moves the index pointer, like the hand on a watch dial, is made to correspond as nearly as possible with the reading of the mercurial barometer, and, like the latter, is expressed in millimetres or in inches. Perfect accuracy in this respect cannot be attained; there will always be required a certain correction for graduation. This and the corrections for temperature are the most important ones for practical work and will be discussed further below.

As apparent from the above, the use of the Naudet aneroid is very simple; in fact, the handling and reading of no instrument could be simpler. But this advantage is obtained by means which, in themselves, constitute the source of undoubted defects. The magnification and the measuring of the small movements of the vacuum chamber are performed by means of an exceedingly delicate mechanism, which is liable to get out of order unless great care is exercised in handling and transporting the instrument. Such constant and unremitting care, however, cannot be exercised under all circumstances, especially not in our country, where the aneroid, in the hands of the railroad engineer for instance, is frequently subjected to swift transportation on horseback over many miles of rough country, the jolting and jarring of which are almost certain to prove injurious to the instrument. Even ordinary transportation in good packing frequently puts a Naudet out of working order, and no dealer in these instruments can warrant their safe arrival at the end of a long railroad journey.

Hence the frequent complaints of engineers, who have bought instruments in New York or some other great centre, and to their dismay find them giving out completely when needed, a calamity which will be all the more annoying, when it happens, as it naturally often does, at a place far removed from any facilities for repairing.

Aside from such heavy shocks, which may at once render a Naudet perfectly useless, an instrument actually used in the field is necessarily exposed to small shocks, which even the most careful and experienced observer cannot entirely avoid, and the continuance of which tends to produce a slackening of the mechanism. The gradual deteriorating from this cause of Naudet aneroids, during their use in the field, is a well-established fact, even when they are in the hands of the best observers. (Report of Mr. J. Campbell, R.N., published in *U. S. Monthly Weather Review*, September, 1879).

Finally a very important defect should be mentioned here, which may not inadequately be termed the "elastic reaction" of the instrument, and which asserts itself in the tardiness with which the mechanism accommodates itself to changes in atmospheric pressure.

C. Kroeber, in his experiments with Naudet aneroids (*Zeitschrift für Vermessungswesen*, Heft. 8, 1881), has found that it took the instrument about two days to accommodate itself to a change of pressure corresponding to five inches of the mercurial column, the readings taken immediately after the pressure had been changed differing nearly two-tenths of an inch from the final ones. If not considered in the case of a measurement of altitudes this difference would have constituted an error of about 200 feet in about 5,000 feet.

It is true that the quality of "elastic reaction" in a measure is common to all aneroids, but it is especially pronounced in the Naudet, on account of its peculiar and complicated mechanism. As apparent from the above, the latter circumstance constitutes the origin of several serious defects, the only remedy for which evidently consists in the simplification of the mechanism.

But it is as evident that such a simplification could not be attained without at the same time sacrificing, in a measure, the ease and simplicity of handling and reading the instrument. Some of the work, which in the Naudet aneroid is performed by the complicated mechanism itself, in an instrument of simpler construction necessarily had to devolve on the observer. The difficulty, then, consisted in harmonising, in the most advantageous manner possible, requirements, the fulfilment of one of which impaired the fulfilment of the other.

III. THE GOLDSCHMID ANEROID.

This problem was solved, after years of experiments, by J. Goldschmid, of Zurich, about 1860, through an entirely novel construction, in which the movements of the vacuum chamber are measured by a micrometer screw acting on a peculiar lever arrangement, combined with optical magnification. In the following diagram, the left-hand side of which represents a section through the instrument, the exceedingly simple arrangement of the working parts is clearly shown.

To the centre of the top of the vacuum chamber A A is soldered a crank-shaped piece, which ends at one extremity in an upward turned knife edge; the latter supports the main lever e e'', which in its turn swings freely around the fulcrum e''. The movements of the vacuum chamber are transmitted by the supporting knife edge to the main lever, the end e of which carries a small hammer-shaped piece. On the face of this is marked a horizontal index line, which will move vertically up and down, according to the varying pressure of the atmosphere. These movements take place alongside of a vertical ivory scale, which serves to measure them and which bears a graduation corresponding to the full inches of the mercurial column (see the right-hand side of *Fig.* 2, which shows the hammer and scale in front view).

While from the ivory scale the full inches only of the aneroid reading can be taken, the following arrangement serves for measuring the tenths and hundredths of inches. A fine and light spring e' e'' is soldered to the main lever near the end e''; at the other end e' it carries a small hammer, similar to the one described before; when no pressure is exercised on the spring this hammer is held by the elasticity of the same a little above the top of the hammer e, standing at the same time sideways of it.

To the cover T T, of the brass case enclosing the entire apparatus, is attached the micrometer screw M, which can therefore be screwed up or down by turning such cover. The lower pointed end of the micrometer acts on the spring e' e, and when a reading is to be taken it is screwed down until the spring has been depressed so much that the index line of e coincides with the index line of e.

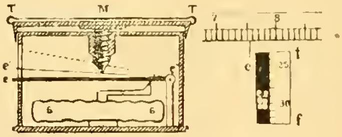


FIG. 2.

It is at once clear that this position of the two hammers, which is shown in the diagram, corresponds to a certain distance between the point of the micrometer screw and the main lever, a distance which remains the same for all the various positions into which the main lever may be raised or lowered by the movements of the vacuum box. The point up to which the micrometer screw has to be screwed down, in order to make the two index lines coincide, is thus made a measure of the position in altitude of the main level. This measure is read by means of a graduation engraved on the circumference of the cover and dividing the same into 100 equal parts, each of which corresponds to one hundredth of an inch of mercurial barometer height. The graduation is so wide that thousandths can easily be estimated.

The *modus operandi* then, in using the Goldschmid aneroid, is as follows:—

The outer morocco case of the instrument is opened, and holding the latter in a horizontal position, the cover is screwed down, while at the same time the two little hammers, protruding from the brass case through a window-like opening, are observed by means of the attached microscope. When the upper hammer is seen to commence moving downward, then the micrometer screw should be turned carefully and slowly, and when the two index lines coincide it is stopped entirely. Before such coincidence is obtained the instrument should be tapped lightly on the top, in order to eliminate any inertia of the mechanism. It is very important that this tapping should always be done in the same position of the hammers, because if, for instance, it is done sometimes before coincidence and at other times at coincidence, then differences in the readings will be the consequence, that may amount to as much as one hundredth of an inch. In order to insure uniformity in this respect it is advisable to make it a standing rule *to tap when the lower edge of the upper hammer arrives at coincidence with the index line;* thenceforward the screw should be turned very carefully, avoiding all further shocks.

(To be continued.)

Memorandum on Exhibitions held in Great Britain and Ireland.*

By the Secretary of the Society of Arts.

THE following particulars concerning International Exhibitions held in Great Britain and Ireland, have been prepared, by instruction of the Council of the Society of Arts, in response to a request of the Secretary of State for Foreign Affairs. They have been put in as summarised a form as possible, only those points of information having been noted which would appear to be specially useful to those having in view the organisation of a new exhibition, such as the main items of expense, revenue, number of visitors, &c. The first part of the memorandum deals with exhibitions held in London, the second with provincial exhibitions.

Reports are in existence giving detailed information about several of the exhibitions referred to. These reports should be consulted for full particulars of the organisation adopted, cost incurred, and success attained in each case. Special reference should be made to the reports of the Great Exhibitions of 1851 and 1862; that on the Colonial and Indian Exhibition of 1886; and that on the Manchester Exhibition of 1887. Much useful information will also be found embodied in the official records of the Sydney (1879) and Melbourne (1880) Exhibitions. Detailed reports on the London Health (1884) and Inventions (1885) Exhibitions were not published, but much information can be gathered from the published balance-sheets.

I.—London Exhibitions.

The first Great Exhibition of 1851 was publicly proposed by Prince Albert, at a meeting of the Society of Arts of London, on the 30th of June, 1849. A Royal Commission was appointed on the 3rd of January, 1850, and the building opened May 1st, 1851. It covered 20 acres, its greatest length being 1851 feet.

The total receipts amounted to £506,243, of which £186,000 was surplus profits. This total was made up of £423,792 for admissions, £67,896 subscriptions, together with payments for the refreshment contract, &c. There was no guarantee fund, the money subscribed providing the funds required before revenue began to come in from the admissions. As there were 6,039,195 visitors, the amount received at the doors represented about 1s. 5d. a head. The buildings cost £169,998, maintenance and police £24,524, personal services £67,309. The prices of admission were 5s., 2s. 6d., and 1s.; there were also two days at £1. Though there were twenty-seven 5s. days and thirty 2s. 6d. days, nearly four-and-a-half of the six million visitors paid their shilling at the doors.

There were three secretaries of the Commission, but the principal part of the work was carried out by an executive committee, of whom the most active members were Mr. (afterwards Sir Henry) Cole, and Mr. (afterwards Sir Wentworth) Dilke.

The system of jury awards was initiated at this exhibition, there being three classes of awards—1st, Council Medal; 2nd,

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* This memorandum was prepared by the instructions of the Council, in consequence of a request from the Secretary of State for Foreign Affairs, who had been applied to by the American Minister for information on the subject of international exhibitions in the United Kingdom. Mr. Lincoln had been moved to apply for the information by the Mayor of Chicago, acting on behalf of the committee who are endeavouring to arrange for the holding of the proposed United States Exhibition of 1892 in that city.

Prize Medal; 3rd, Honourable Mention. Of the first, there were awarded 171; of the second, 2,954; of the third, 2,123. The juries were international.

The very careful jury system organised for this exhibition has received for succeeding exhibitions various modifications, but its main principles have remained unchanged wherever awards have been made.

The number of exhibitors was 13,937; British 6,861, colonial 520, foreign 6,556.

At the close of the exhibition the Royal Commission was made permanent, and the surplus funds (£186,000) invested in land at South Kensington. Various public buildings have been erected on the Commissioners' estate, the profits from which have been and still are devoted to the promotion of science, art, and education.

Full details of the finances, organisation, &c., are given in the First Report of the Commission, issued in 1852. The reports of the juries were issued separately.

The Exhibition of 1862, like that of 1851, was originated by the Society of Arts. It was held in buildings erected for the purpose on the estate of the 1851 Commissioners, some of the buildings being permanent, and having since served for other purposes, notably for later exhibitions on the same spot. The organisation was very similar to that of its predecessor, a Royal Commission being appointed for it.

A guarantee fund of £400,000 was raised by the Society of Arts before any other steps were taken for the organisation of the exhibition. The total receipts were £459,631. This amount was insufficient to meet the outgoings, and, in order to avoid a call upon the guarantors, the contractors, Messrs. Kelk and Lucas, reduced their claims by about £65,000, and Mr. (afterwards Sir John) Kelk made a donation of £11,000 to the funds. In consideration of the abatement the contractors took over the whole of the property of the Commission. The admissions amounted to £408,530, the refreshment contract to £29,285. The chief items of expenditure were—buildings, £329,001; roads, £13,358; salaries, £45,778; police, £19,435. There were 6,211,103 visitors, and they paid a little less per head than those in 1851, viz., 1s. 4d.

The exhibition suffered a great deal from the death of Prince Albert, which took place in the December of 1861. The fact of its being held during a season of national mourning was quite sufficient to account for its want of financial success. It was opened on the 1st May and closed the 15th November, 1862.

The total area of the building was 1,291,127 square feet. There were 28,653 exhibitors, of whom 16,456 were foreign.

As before, jury awards were made. A single class of medal only was given, but a large number of honourable mentions were added by the juries. The medal itself was of bronze. The number of medals voted was nearly 7,000, with about 5,200 honourable mentions.

A very full report of the proceedings of the Commission was published in 1863. The jury reports were published in a separate volume by the Society of Arts.

A proposal to hold in 1871 a third great exhibition in London did not meet with favour, and instead a suggestion put forward by Mr. Cole for a series of annual international exhibitions was adopted. The series was intended to last over a period of ten years, in accordance with the following classification:—

1871.—Pottery of all kinds; Woollen and Worsted Fabrics; Educational Works and Appliances.

1872.—Cotton; Jewellery; Musical Instruments; Paper, Stationery, Printing.

1873.—Silk and Velvet; Steel, Cutlery, and Edge Tools; Surgical Instruments and Appliances; Carriages; Substances used as Food; Cooking and its Science.

1874.—Lace, hand and machine made; Civil Engineering, Architectural and Building Contrivances and Tests; Leather, including Saddlery and Harness; Artificial Illumination by all Methods, Gas and its Manufacture; Bookbinding.

1875.—Woven, Spun, Felted, and Laid Fabrics (when shown as specimens of Printing or Dyeing); Horological Instruments; Brass and Copper Manufactures; Supply of Water.

1876.—Works in Precious Metals and their imitations; Photographic Apparatus and Photography; Skins, Furs, Feathers, and Hair; Agricultural Machinery and results; Philosophical Instruments, and processes depending upon their use; Electricity.

1877.—Furniture and Upholstery, including Paper Hangings and Paper Maché; Health—Manufactures, &c.

1878.—Tapestry, Embroidery, and Needlework; Glass; Military Engineering, Armour and Accoutrements, Ambulances, Ordnance and Small Arms; Naval Architecture—Ships' Tackle; Heating and Combustion.

1879.—Matting of all kinds, Straw Manufactures; Flax and Hemp; Iron and General Hardware; Dressing Cases, Travelling Cases, &c.; Horticultural Machinery and Products; Magnetism.

1880.—Chemical Substances and Products, and experiments, Pharmaceutical Processes; Articles of Clothing; Railway Plant, including Locomotive Engines and Carriages.

The 1851 Commissioners guaranteed a sum of £100,000, the buildings remaining from the 1862 Exhibition were assigned for the annual series, and in accordance with the programme the first exhibition was opened in 1871. It attracted 1,142,154 visitors, and was a moderate financial success, but its immediate successors were less fortunate, and after the fourth, the non-success of the scheme was admitted, and the series was brought to an end.

Though these exhibitions were entitled international, the contributions from foreign countries were not very considerable.

No jury awards were made; a commemorative medal was given to each exhibitor.

That the idea of a series of exhibitions limited to specified arts and industries was a good one, was proved by its success a dozen years later, but the first attempt broke down in practice from various causes.

It was renewed under better auspices, and with conspicuous success in 1883, in which year another series of international exhibitions was commenced in the same locality as in 1871, viz., on the estate of the 1851 Commissioners at South Kensington.

The first of these was the Fisheries Exhibition in 1883, proposed by and carried out under the active management of Mr. (now Sir Edward) Birkbeck. This was the outcome of a Fisheries Exhibition which had been held at Norwich, the promoters of which took up the idea of holding a similar exhibition in London. It was not under the authority of the Government, though the Prince of Wales was President, and the Government appointed Commissioners to make the jury awards, and treated its correspondence as official.

Only a small portion of the buildings erected in 1862, and employed for the 1871 series, were now available, the greater part having been utilised by the Science and Art Department for certain of their scientific collections and for other purposes. It was therefore necessary to erect buildings of a temporary character. Those set up in the first instance for the Fisheries were afterwards enlarged and added to for its successors. They were all of the cheapest possible construction, though admirably suited for their purposes.

The buildings were lighted by electricity, and were opened at night. Though this was not the first experiment of evening opening (which was tried at Dublin in 1865) it was the first on a large scale.

The Fisheries Exhibition was credited with a gross receipt of £162,903, of which £117,869 was obtained by the admission of 2,703,051 visitors (about 10d. each), and £8,702 was subscribed. But over £11,000 of this total amount was rent charged against the exhibitions which succeeded the Fisheries. The Fisheries buildings cost £44,238; their electric lighting, £10,397; salaries and wages, £14,098 (including police); publications, £17,399; conferences, juries, and jury awards, £11,288; advertising, £11,045; music, £5,255; gardens, £3,740. The surplus at the close was £14,752.

At the closing ceremony of the Fisheries Exhibition, the Prince of Wales suggested that the series should be continued by holding in 1884 a Health and Education Exhibition; in 1885, an Inventions and Music Exhibition; and in 1886, an Exhibition illustrative of the products of the British Colonies and of the Indian Empire. This scheme was carried into effect. For each exhibition a guarantee fund was subscribed before it was opened. For the Health and Inventions Exhibitions Executive Councils were appointed, of each of which the Prince of Wales acted as president. Like the Fisheries, these had no connection with the Government, the only assistance it rendered being that the Health Exhibition, like the Fisheries, was given free postage, though this privilege was not accorded to its successor.

The Health Exhibition contained illustrations of sanitary science in all its applications, and of education in every grade. A most important feature of it, as of the Fisheries, was the garden, which was illuminated every evening. It was at the Health Exhibition that illuminated fountains were first shown. Another novel and very popular feature was a reproduction of an old London street in the grounds. This idea of reproducing typical examples of mediæval domestic architecture was adopted in several later exhibitions—Edinburgh, Manchester, and Glasgow, as well as in the Paris Exhibition, where an old Cairo street is represented.

The Royal Albert Hall, a building capable of seating 8,000 persons, was practically included in this and the succeeding exhibitions, and served for large assemblages, musical entertainments, &c.

The Health Exhibition had a total receipt of £237,048, of which £178,509 was derived from 4,153,390 visitors (about 10d. each). Donations amounted to £11,824. £12,023 was merely a nominal asset, since it represented an amount due from the Inventions for buildings and plant, but remitted. New buildings, including Old London, cost £47,045; electric lighting, £23,140; rent, £16,888; and rates and taxes, £1,573. Salaries and wages, £21,987; publications, £15,902; juries and conferences, £7,832; advertising, £15,764; music, £14,181; gardens and illuminations, £7,611. The Health surplus was £15,580.

The nature of the Inventions Exhibition is sufficiently indicated by its name, though it is to be remembered that it contained a second division—Music and Musical Instruments. An important part of this division consisted of a collection of old musical instruments. The garden illuminations were for the first time electrical, small incandescent lamps of various colours being used. The exhibition was financially less successful than its predecessor. Its total receipts were £196,312, of which £149,825 were obtained from the payments of 3,760,581 visitors. £600 were received from subscriptions. The total payments amounted to £214,403, leaving a deficit of £18,089, which was made up by absorbing the surplus of the Health Exhibition, and by a grant from the funds of the Colonial Exhibition. The main items of disbursement were as follows:—Buildings, £30,778; electric light, £37,551; salaries and wages, £25,064; publications, £10,829; jury awards, £5,187: rent, £4,126; rates and taxes, £3,430; postage, £3,661; advertising, £14,940; music, £17,039; gardens and illuminations, £15,964; motive power (machinery), £14,848.

The deficit is easily accounted for by the amount of the second and of the last three items. A large amount of machinery was shown; the electric garden illumination was costly; and large sums were expended on the admirable musical entertainments given in the gardens and in the Albert Hall.

That the receipts from this exhibition were smaller than from the Health Exhibition was attributed to the wet weather which prevailed during part of the time it was open.

All these exhibitions were distinctly international, though the contributions from foreign countries varied much in amount and importance. The most important foreign exhibits were in the Fisheries Exhibition and in the educational division of the Health.

In all cases the juries were international, and the medals were gold, silver, and bronze, each medal being accompanied by a diploma. In the Health and Inventions the British jurors were, in the first instance, nominated by the exhibitors, the foreign jurors being appointed by their respective commissioners.

(To be continued.)

Paris Fashions.

(Continued from page 110.)

THE *flowerets trefoil* are mostly in fashion. They are formed of pearls, etc., and in the centre a brilliant is placed, which has the effect of a dew-drop. Sometimes a small subject on a moon-stone, or a country scene on enamel, is placed in the centre. These subjects, flowers, country scenes, etc., are also used for scarf-pins.

There is another kind of brooch quite new and original. It is a subject in gold filigree, which can be compared only to a nest or niche. The gold threads seem to have been thrown in promiscuously, and from the rounded centre appears the bust of a divinity, or of an historical personage; for instance: J. J. Rousseau, Carnot, Washington, Jeanne d'Arc, etc. The busts are always white, like marble, and are made of divers composition.

The *Brooches-Derinettes* are a series of brooches which have just been patented (?) and which I have just seen exhibited for the first time. Your readers will probably remember the description I gave of a visit I paid, about two years ago, to the *Musée Sarigne*, which contains a host of "revolutionary" jewels, among which are guess brooches and motto brooches. There is nothing new in this kind of brooch, except that the ornaments are a little more varied, and I may say that it was scarcely worth the trouble to take out a patent.

A curious fancy article, which is being sold to a great extent at watering-places, is a jockey cap, used for holding a powder puff, after the style of the purses already made on this model. I merely mention this because the jockey cap possesses a very pretty jewel band, and a gold or silver subject applied.

At bathing places the bracelet in gold, called "Sport," is greatly worn. It is formed by a whip having at the handle a large pearl; and the thong, after going twice round, ends in a spiral, and winds itself around a horse-shoe, adorned with brilliants. This is the latest novelty of its kind.

At official evening parties the ladies wear a thistle aigrette of gold, reserving their valuable ornaments for winter parties.

Both sexes wear yellow shoes, and the ladies have added a large silver clasp which may be said to form part of the boot or shoe. This is simply an ornament.

In the way of watches there are very few novelties for gents. There is however, just out, a *remontoir* (keyless) watch, surnamed the *Nationale*. The inner circle is small, and of white enamel, the outer circle—that is to say, outside of the handles—being composed of the three colours of France. The pendant is a copy of the Revolution watch-key. There is another watch, *remontoir*, with ordinary dial, and case of silver. On the inner part of the case is a thin sheet of gold with the figure of the Republic in unburnished gold. It is in fact, a fac-simile of a five-franc piece, gilded, and bears the words: "Souvenir of the Exhibition, 1789-1889."

For ladies all the Louis XV. and Louis XVI. watches have been revived. These watches were at that time called *œufs de Nuremberg*, or, commonly speaking, "Onions." They are, however, greatly reduced in size and can be used as brooches. This is more in the jewellery than in the watch-making line. At the retrospective museum in the Trocadero there are models of the watches of that period, and a visit to the said museum would give an idea of the modernised watches. In some cases the watch is rounded, and always with a little chain; on opening it, on one side there is the dial, and on the other the place for a powder puff. There are also watches in rock crystal, the clasp only being of gold; this is a very near imitation of the knobs on walking-sticks, only they are absolutely round. The other watches of this species take all kinds of shapes, such as half-moon, flat, oblong, rectangular, etc. The best parts of these watches is the ornamentation, which is very rich. They are sometimes ornamented with diamond stars, sometimes with rubies or other coloured stones, and often with embossed matter, forming very charming subjects, such as a trefoil, a small sun, etc.

The butterfly is also greatly in fashion at bathing places, the ladies decorating their hair with them in profusion. These insects are sold separately, and are furnished with a piece of wire in order to enable the ladies to attach them to the corsage or waist.

The jewellers have not remained in the background; instead of the butterflies of lace, velvet, etc., sold by the modistes, they have conceived the idea of butterfly "jewellery." These have, like the others, a flexible tail, but are paved with diamonds, pearls, or coloured stones, and have the double advantage of being taken to pieces and used as brooches or hair-pins.

The latest hair-pin is a gold sun, which can be taken down and used as a brooch. In the centre is a diamond trefoil, the rays surrounded by a circle of sapphires. This pin is very handsome, and is sure to meet with great success.

There is a gold purse which, when open, has the appearance of a tobacco pouch. To the left it is furnished with a clasp, in the shape of a cup, with a spring, which goes slightly beyond the diameter of a twenty-franc piece. By a special mechanism this purse shuts and extends itself, and leaves nothing to be seen at the top except the small cup in the same way as the gold Louis cases.

There is a brooch called "The Cornet," quite new, and which is a success. From the top of the "cornet" there issues very small swallows in diamonds. The "cornet" is generally of gold, which sets off the swallows to advantage.

There are being exhibited on the grand Boulevards, brooches of English origin: square with white groundwork, on which are mottoes in English, as well as advertisements for certain commercial houses. I don't know the prices of these enamelled and gold articles, neither do I know the conditions under which they are sold.

The cat's-eye is always in favour; it is the central point in many jewels, around which the ornaments gravitate.

Florentine Pietra Dura or Mosaic Work.

HER Majesty's Consul-General at Florence says that the proper technical term for the so-called Florentine mosaics is works in *commesso*. They are composed of delicate slices of stones, carefully cut into shape, arranged and joined together *(commessi)* with a fine cement, and then fitted into a thin slab of marble. The pictures are produced by the natural tints of the stones, the selection of which require great taste and skill. Works in *commesso* are executed in the following manner:—After the design has been prepared, the thin slices of stone selected for the various parts are distributed among a certain number of workmen, each of whom completes the portion of the design entrusted to him, the whole subject being subsequently united. The stones, after being cut into the required shapes, are carefully set together with a cement made of wax and mastic *(pece greca)*, heat being used to bind them together. Slate is employed to support the work during its progress, and to line it when complete. At each stage the first lining affixed to the separate parts is ground down and a fresh one affixed, so that an even surface may always be secured. When the complete design is fitted into the marble slab prepared for its reception, the whole of the base is again ground down to a perfect plane, and is lined with a fresh backing of slate. The fitting is performed with the greatest care, the edges of the several parts being filed until the exact dimensions have been attained. The whole surface is afterwards polished, so that the lines of juncture are rendered almost invisible. To bind on the lining heat is used, as also for uniting the smaller pieces. The operation is very carefully performed, so that no more cement than is absolutely required should remain between the parts that have been joined together. The first operations of sawing the stones into thin slices, from 2½ to 3 millimetres in thickness, is performed by means of thin blades of iron or copper, emery powder giving the required friction. The slices are further sawn into the shapes required to form the various parts of the design by iron or copper wire attached to bows, and always with the aid of emery. The finest emery powder *(poltiglia)* is used for polishing the surface of the stones, and emery is employed for grinding down the linings. For this purpose the work is placed on a fixed slab of marble or slate, iron plates of various sizes and thicknesses, according to the dimensions of the slab, and having wooden handles, being steadily worked over it by one or two men, as required. Sir Dominic Colnaghi says that it would be interesting to trace the origin of this art, and to follow its development from classic times, through Siena to the present style of work, which began to be practised about the middle of the 16th century. Portraits, landscapes, and architectural views were first produced, but it was soon felt that these subjects were unsuited to the materials employed. Decorative designs and imitations of fruits and flowers therefore took their place, and form the most successful subjects of modern works executed in *pietre dure*. It has been doubted whether the introduction of the art of working in mosaic into Florence, under the patronage of the Grand Dukes of the house of Medici, is due to Tuscan or Lombard artists, as it would appear to have flourished contemporaneously in both regions. While, however, it has died out—or nearly so—in Lombardy, it has survived in Tuscany, to become an important branch of Florentine industry. To provide stones for the works in real *pietre dure*, Europe, Asia, and the North of Africa have been laid under contribution, and the Royal Factory possesses a large collection of stones valued at some 20,000 lire. Among the principal stones employed are amethysts, agates, the sardonyx and chalcedony, flints, and many varieties of jasper, pebbles from the Arno (which generally contain a large proportion of lime), and petrified woods. Among the rocks which are chiefly used for works of decoration are red Oriental, Egyptian, and other granites, *verde di Corsica* labradorite, antique, porphyry, green porphyry, Oriental serpentine, jade, basalt, silicious Breccia, and *lapis lazuli*. Black marble from Belgium is largely used as a foundation, and slate, as has already been mentioned, is employed as a lining for works in *commesso*. The hardness of the materials employed, requiring patient industry to work them, accounts for the costliness of works in *pietre dure*, of which 75 to 80 per cent. is attributed to labour. The commercial articles met with in the Florentine shops are chiefly composed of the softer qualities of calcareous stones, while shells are used for the white and pink tints, and coral is occasionally inserted. The workmanship, design, and effect are often excellent, but they are able to be produced at much less cost than the works executed at the Royal Factory, of which the following is a short notice. Although artists in mosaic had been employed by Duke Cosmo do Medici in previous years, the foundation of the Royal Factory of *pietre dure* in Florence may, perhaps, be considered to date from about the year 1754, when some rooms in the Casino di San Marco were assigned for the residence of the masters of the art. The factory was principally founded to carry out the works of the great sepulchral chapel of the Medici in S. Lorenzo. This chapel would appear always to have been intended to receive the monuments of the princes of the House of Medici, and never, as tradition avers, to become the receptacle of the tomb of our Lord, which was to have been conveyed to Florence from the Holy Land by the Druse Emir Faccardin (Fakhr-ed-Din). The slow progress of the chapel enabled the artists employed in the factory to execute other works, which were presented by the later Medici princes, on different occasions, to foreign sovereigns, thus extending the reputation of the factory. Some of the artists appear to have tried their fortunes in foreign lands, but it is thought that a part at least of the works in *pietre dure*, executed in the Taj Mahal of Agra, are of Florentine origin. In 1723 a small factory was founded at Naples, which existed until 1860, when it was suppressed; but no rival rose to compete with Florence until the establishment of the Imperial works at St. Petersburg for mosaic in relief, about the year 1840. The mosaics executed in the factory of the Vatican, at Rome, are of an entirely different character from the Florentine works in *commesso*. On the overthrow of the Grand Ducal Government in 1860, the works of the Medicean chapel were suspended until the beginning of 1883. Since this date about 135 square metres of the pavement executed in *commesso* on a large scale have been completed. The total area of flooring of the octagon, excluding the recesses, is 642 square metres. The completion of the chapel has been entrusted by Ministerial decree to the Royal Factory. The total cost up to the present time is estimated at 16,300,000 lire, or £625,000. The average annual value of the production of the factory is calculated at 52,000 lire, of which about 12,000 represent works sold in Italy and abroad on private commissions, and the remainder in part works placed in the museum of the factory, and partly repairs in mosaics, &c., existing in the Royal Galleries of Florence, from which the administration of the factory now depends. The works executed are marble table tops, panels for furniture, caskets, letter weights decorated in *commesso*, both flat and in relief, vases, cups, statuettes, columns, and other ornamental works. At the present time, says Consul-General Colnaghi, a large piece is being executed, combining all the different kinds of works—*commesso*, *intarsio*, relief and in the round. The work consists of a large black vase, richly decorated with flowers, fruit, birds, &c., and is the first example of *commesso* work applied to a curved surface. All the work is carried on by hand; there is no machinery, though this is much needed, it is said, in the sawing department. For about two centuries and a half the production of the Florentine mosaics had remained a monopoly of the Royal Factory; it was not till 1825 that there was an industrial application of the art to small articles of jewellery and ornaments. To effect this, however, the true *pietra dura* had of necessity to be put on one side, and its place taken by calcareous stones and shells, thus allowing the work to be executed at reasonable rates. Between 1863 and 1873, the period when the city was the capital of Italy, there was especially a considerable increase in the industry. Since 1873 a variety of causes—such as the removal of the capital, the cholera (which caused a temporary diminution in the number of visitors to Florence), and changes of fashion—have led to a decrease in the production. The outfit of a mosaicist is very simple. With a small table, a basin of water, a brazier, a vice, some copper and iron blades to be used as files, a bow strung with iron wire, a little emery powder, and a few stones already cut into slices, which cost only a few francs, his equipment is complete.

Defective Sight and its Optical Correction.*

By W. D. Mason, A.P.S.

(Concluded from page 99).

SPECTACLES.

SPECTACLES may be divided into spectacles proper and eyeglasses.

The principal parts of a pair of spectacles are the lenses, the rings or eyes, the bridge or nosepiece, and the sides.

The lenses are the most important, the frame being merely to hold them in the best position before the eyes as comfortably and securely as possible.

The different kinds of lenses are convex, concave, cylindrical, sphero-cylindrical, and prismatic.

Ordinary convex and concave lenses are called spherical because the curves of their surfaces respectively form portions of solid and hollow spheres.

Convex lenses may be bi-convex, plano-convex, and concavo-convex.

Bi-convex or double convex lenses are convex both sides alike, and are recommended by many of the highest authorities when convex spectacles are required.

Plano-convex lenses are not much used, as they possess no particular advantage, and objects appear more distorted when seen through them sideways than with other kinds. They are convex one side and perfectly flat on the other.

Concavo-convex or periscopic lenses are crescent shaped when seen edgeways. They are convex on one side and concave on the other, but more convex than they are concave. These were formerly considered superior to all others, as it was thought they gave a wider field and better lateral vision. They are heavier and more expensive than bi-convex, and reflect images of objects behind the wearer to a greater extent than other lenses.

All convex lenses are thicker in the middle than at the edges.

Convex lenses are used for hypermetropia and presbyopia.

Concave spectacles also may be bi-concave, plano-concave, or concavo-convex.

The same remarks apply to these as to the convex, both as to their relative merits and construction, except that their description should, in each case, be reversed, the bi-concave being alike on both sides, the plano-concave flat on one side and concave on the other, and the periscopic being more concave on one side than convex on the other.

All concave lenses are thicker at the edges than in the middle.

Concave lenses are used only for myopia.

All convex glasses magnify and all concave glasses diminish according to their strength; they are not used specially for these properties, but to bring the rays of light to a focus earlier or later than the unaided eye would otherwise do.

When reading with magnifying spectacles the stronger the lenses, the nearer the book must be held to the face.

Cylindrical lenses are plane on one side and form portions of convex or concave cylinders on the other. They magnify or diminish in one direction but not in another, and if held at a little distance cause a distortion in the shapes of objects seen through them, apparently drawing them out in one direction or compressing them in another.

Sphero-cylindrical lenses are like the last, but the plane side is ground as an ordinary convex or concave lens.

Bi-cylindrical lenses are convex on one side and concave on the other, the axes of the two cylindrical curves being at right angles to each other.

Ordinary plano-cylindrical lenses are used for the correction of simple astigmatism only.

Sphero-cylindrical lenses are for the compound and mixed forms of astigmatism.

Bi-cylindrical lenses were contrived for the relief of mixed astigmatism, but sphero-cylindrical lenses are more commonly used.

Prismatic lenses or prisms are wedge-shaped, having two flat surfaces inclined to each other, and are of the form of a piece stamped out of a knife blade.

They neither magnify nor diminish, but cause an apparent displacement of objects away from the base and towards the thin edge or angle of the prism.

They are very useful for testing the power of convergence, and are sometimes prescribed in asthenopia.

Combination lenses are prismatic on one side and convex or concave on the other. They are also used by weak-sighted patients, but, being thick and heavy, and having the property of making straight lines appear curved and flat surfaces convex or concave they have not found much favour, and have been generally superseded by ordinary spherical lenses.

Orthoscopic lenses are combinations of spherical lenses and prisms, in which the angle of the prism bears a certain definite relation to the focus of the spherical lens, so that in using them there shall be no excess of accommodation over convergence or of convergence over accommodation. Though theoretically perfect orthoscopic lenses cannot be regarded as a success. They rest the eyes too much, and weak eyes cannot grow stronger without exercise.

Besides lenses, properly so called, spectacles are often fitted with perfectly plane or flat glasses, or bent or globular glasses with parallel surfaces and of the same thickness throughout.

These glasses are generally blue or smoke colour, sometimes grey or green. They allow the rays of light to pass through them unaltered, and are of no use as a remedy for defective sight. They are often called "preservers," and are merely used to screen the eyes from the wind, dust, or glare of sunshine or other strong

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light. They are also useful as a protection from the dazzling whiteness of snow, especially in strong sunlight.

Convex and concave lenses are often made of tinted or coloured glass, to answer the double purpose of subduing the light and correcting defective vision.

Coloured glasses should only be used as shades for occasional wear when the eyes are irritable and inflamed, or when exposed to strong light, dazzling reflection from water, white roads, &c.

No person should wear them continuously and permanently, except under the advice of a surgeon, and they should not be used in a dim light, for though they intercept certain rays and thus take away a portion of light from the eyes, they add nothing to the light. Solar or white light is the best for the eyes, as it is the most natural.

Some people wear coloured glasses constantly for years, and their eyes get into such a morbid state of irritability that they cannot bear the healthy light of day.

If you are purchasing convex or concave spectacles for some defect in your sight do not be persuaded to have them coloured or tinted, unless there is a good reason why such lenses should be preferred. You may fancy your sight is weak, but probably when the defect is properly corrected the apparent weakness will speedily disappear.

The best material of which spectacle lenses can be made is Brazilian pebble. This is a kind of quartz or rock crystal.

Optically the effect is the same in looking through a pair of lenses whether they are made of glass or pebble. If they are of the same focus and equally clear and perfect no difference will be observed.

But pebble is harder, cooler, and more durable than glass ; is not easily scratched, and retains its perfect clearness and transparency under all ordinary conditions. Apart from accidents a pair of pebble lenses will outlast several pairs of glass ones and be as good as ever.

Still it is much better to wear good glasses than bad pebbles. The latter should always be cut from a clear crystal in a direction transverse to its axis. If cut parallel to the axis or in any oblique direction, or from inferior crystals marred by flaws and imperfections, they may seriously injure the sight, besides affording only blurred and indistinct vision during use.

Spectacle frames are made of various materials, such as steel, horn, tortoise shell, silver, and gold.

Gold is best for appearance and durability, but for strength and lightness steel cannot be surpassed, and is more used than any other material.

Steel frames are often nickel-plated to prevent rust, and this may be regarded as a distinct improvement.

The frame of a pair of spectacles should be sufficiently strong to hold the glasses rigidly in their proper position, and at the same time sufficiently elastic to escape fracture under ordinary circumstances and with fair usage.

The rings or eyes of spectacles are generally slightly grooved inside to receive the edge of the lens, but some lenses are grooved so that the frame is let into the glass.

Spectacles with grooved lenses present a much lighter appearance, and there is less likelihood of the lenses becoming displaced and falling out.

Concave lenses, with their thick edges, afford room for good, deep grooves all round, and are the most suitable for mounting in this fashion.

Unless very carefully done, convex lenses, with their thin edges, are often imperfectly grooved, and more liable to accident than if framed in the ordinary way.

The bridge, or nose-piece, of a pair of spectacles may be of various forms. Ordinary, or crank bridges, of different widths and heights, straight, X, Ke, and W, are some of the kinds used to suit the peculiarities of individual faces.

The sides may be straight, curled or hooked, or turn-pin. Hook and turn-pin sides are to fasten behind the ears for greater security.

Whenever practicable spectacles should be of the best quality, both as to lenses and frames, and made specially to fit the face, or at least chosen with reference to fit as well as focus.

The eyes should look straight through the centres of the lenses, and when worn for distance the glasses should be kept well up before the eyes and the lenses should just clear the tips of the eye-lashes.

Reading glasses, worn by the presbyopic, may be placed lower down the nose, so that they do not interfere with distant vision when the eyes are raised from the book or work. Pantoscopic spectacles have the frames specially arranged for reading. The lenses are inclined forward at an angle, and are flat at the top, to allow the eyes to look over them for distance, and through them for reading or writing.

Eyeglasses are made both single and double. Single eyeglasses cannot be recommended, as by their use the sight of one eye is generally suppressed and its acuteness of vision greatly impaired. Besides, the effort necessary to keep them in position is not conducive to comfortable and easy vision.

Double eyeglasses, or folders, are very useful in old sight or short sight for temporary purposes, but are not equal to spectacles for continuous wear. It is highly important that the eyes should look through the centres of the lenses, and with eyeglasses this requirement is seldom fulfilled.

Folders worn suspended by a guard round the neck are handy, and quickly adjusted for use and taken off again, and it is often advisable to carry them in addition to spectacles, but after all, as an eminent authority says, "they must be regarded as more or less ill-fitting spectacles.

Nothing should be used to wipe or rub glass lenses but a small piece of clean, soft wash-leather kept specially for the purpose.

An ordinary handkerchief soon gets loaded with fine particles of dust and grit, and in a few months covers the surface of the glass all over with very fine scratches, which are seldom noticed because not looked for, but which cannot fail to injure the sight by interfering with the free passage of the light through them.

A fine silk handkerchief is not much better, as rubbing glass with silk generates electricity and attracts the dust.

Pebble lenses may be rubbed with any kind of handkerchief without the slightest danger of scratching.

From the foregoing remarks it will be seen that one pair of lenses of good quality and of a given focus is precisely like another, and that the ordinary announcements of advertisers that their "spectacles are clear, cool, and never tire the eyes, but strengthen and preserve the sight, and are now to be obtained of agents throughout the kingdom, &c.," are nothing but sheer quackery; for successful treatment of defective vision depends, not upon the particular make of spectacles kept in stock, but upon the knowledge and skill of the dealer in ascertaining the refraction and amount of accommodation of his customer's eyes, making the necessary calculations and allowances, and supplying the spectacles best adapted to the particular case under consideration.

It is scarcely necessary to add that in this knowledge and skill most of these agents are wofully deficient.

The Moonstone.

By Jno. K. Allen, of the Holley Publishing Co.

WHEN Wilkie Collins, that brilliant romancist who has so lately ceased to contribute to the literature of the world, wrote his engrossing novel, known as "The Moonstone," he well knew the potency of a superstition of a peculiar type—a superstition descended to us from the earliest days in which gems became of value to mankind, and scarcely less prevalent now in regard to some particular stones, the madstone for example, than it ever could have been in the earliest days of fanciful Eastern imagination. All the stories we read relating to the wonderful attributes of certain gems, their ability to render the wearer invisible or invincible, and their possession of other supernatural powers, come to us from the Oriental East, that exuberant and overgrown garden of fancy and unbridled fiction. Around the moonstone there has always clung the memory of the ancients' reverence for it as being peculiarly sacred to the lunar deity, and the glinting rays shot from it set all the early story-tellers in a blaze of delightful composition.

Wilkie Collins has done more than all others writers to make the name of this gem a familiar one, but, strangely enough, his moonstone was not a moonstone, but a diamond, a great, yellow diamond, set in the forehead of the four-handed Indian god who typified the moon. To quote from the prologue to his novel: "Partly from its peculiar colour, partly from a superstition, which represented it as partaking of the nature of the deity who it adorned, and growing and lessening in lustre with the waxing and waning of the moon, it first gained the name by which it continues to be known in India to this day—the name of the Moonstone.

Queerly enough Collins selected for the gem which brought vengeance on all who had to do with its separation from its idolatrous setting, a diamond; in doing thus he exercised a romancer's licence, and associated the myth connected with the moonstone with a gem entirely unlike it in reality. But the world of fiction is not the world of fact, and the moonstone has now little more than a history to tell, because it has pleased the fashionable world of to-day to overlook entirely a gem which, 60 years ago, was quite the rage.

To the finer varieties of gypsum, scientists have applied the name selenite, a name which indicates the soft, pearly lustre reflected from its surfaces. Gypsum in its most common form is much too soft to be of any real service as an ornamental mineral, but it presents fibrous forms quite pleasing when polished. Selenite literally signifies "moonstone," yet in the labyrinth of science the terms have ceased to be associated, and no jeweller would be guilty of calling selenite moonstone, the former word being now invariably applied to an entirely different stone. It has even come to be the case that the selenite of to-day, so plentifully quarried at Grand Rapids, Michigan, and elsewhere, is not at all the selenite of the ancient time, the modern stone being a hydrated sulphate of calcium, so soft as easily to be cut with a knife.

In former years, when "selenite" was applied to the moonstone, Andrea Baccio, an Italian physician and naturalist of the 16th century, with the superstitious knowledge of the times, wrote: "The selenite is a kind of gem which doth contain in it the image of the moon, and it doth represent it, increasing and decreasing according to the increasing and decreasing of the moon in its monthly changes."

This peculiar stone was particularly valued by the Greeks, who called it aphroselene, which signifies the moon's splendour or beams, and, as their poetic imaginations, unhampered by knowledge, discovered in natural objects resemblances to other forms, they ascribed to these objects virtues and properties which suited their dreamy interpretations. A good example of this faculty of fancy is shown in connection with their treatment of the moonstone, a faculty which has extended to other people. Dioscurides, a Greek artist who lived at Rome during the reign of Augustus, and who was reputed to be the greatest gem-engraver of ancient times, wrote, that the "lunaris," as the Romans called the moonstone, "is found in Arabia, and is endowed with virtues, as of making trees fruitful and of curing epilepsy." This veracious chronicler adds in all seriousness, "that in the night it will illuminate the place that is next to it, yet not by any transmission of light, but by the collection of light into itself." Pliny, that erudite Roman naturalist, whose taste in reading inclined to the marvellous rather than the important, speaks of the moonstone, probably of the "fish-eye" variety: "Shining with yellow lustre from a colourless ground, containing an image of the moon, which daily waxes and wanes according to its state," and Marbodus even more credulous than Pliny, describes the stone itself as growing and shrinking, and its colour that of jasper or emerald. Another author says the "fish-eye" moonstone was so named "because it displays, as it were, an eye within itself, which increases or diminishes according to the growth or decline of the moon."

While the stone has but little value at the present time, those who cared to be versed in gem lore hold it remarkable for the fables which cling to it. Burnham says "it is no easy matter to class this chameleon-like gem, since it claims kindred with so many species and passes under so great a number of names," but whatever the moonstone of the ancients may have been, the moonstone of to-day is stripped of all imagery, and in the didactic language of cold but bright-eyed science is an opalescent variety of straight-cleaving feldspar. Its hardness is six, and its specific gravity is almost invariably 2.58. It contains in 100 parts:

Silica	...	...	...	64½ parts.
Alumina	...	...	...	18½ ,,
Potash	...	...	...	17 ,,

Traces of soda, lime, and magnesia.

While the moonstone of the ancients was quite appropriately termed selenite, the mineral of to-day is not so well named. It is known as adularia, from Mt. Adula, one of the highest peaks of the Lepontine Alps, in that group to which the St. Gothard pass gives its name, and whose bowels have since been pierced by the railway tunnel. The best specimens of the gem, however, come from Ceylon. "It occurs in crystals, crystalline fragments, and solid masses; its fracture is uneven; it is translucent on the edges, with a double refraction of light; the lustre is vitreous and pearly, more especially when cut and polished." The light thrown out from the interior of the stone is greenish and bluish white, the reflections being changeful in colour when viewed in different aspects. The cleavage of the stone is in two directions, the crystals often being found in the hemitrope form, having a compound structure, which may be imitated by bisecting a crystal and revolving one half 180 degrees (or in some cases 120 degrees), and then re-uniting the halves. In polished specimens this form becomes obvious from the different directions of the laminæ. Adularia is found in cavities of the granite, gniess, and limestone, and in pebbles from Ceylon, Greenland, Bavaria, St. Gothard, Tyrol, Dauphine, and at several places in this country, particularly at Ticonderoga, N.Y., Maryland, Pennsylvania, Connecticut, and Massachusetts. The adularia from St. Gothard is found in very large masses, and at Zurich, Switzerland, there were formerly on exhibition in the museum, groups of crystallised adularia measuring two feet in length and one foot in thickness, which glinted with royal beauty.

The gems are secured by taking specimens which possess good colour and strong pearly reflections and cutting them out of larger lumps. The piece is then ground on a lead wheel, *en cabochon* form, and is then polished with rotten-stone.

In commerce the adularia goes under various names, such as moonstone, sunstone, girasol, fish-eye, Ceylon or water opal. The difference between the moonstone and the sunstone seems to be in colour only, the moonstone being white with small bluish or greenish shades, while the sunstone shows a yellow and reddish play of colours. The sunstone is another member of the feldspar group, its internal prismatic reflections and minute spangles being due to the presence of included crystals of oxide of iron or of mica. It is found in limited quantities in Norway, and also at Media, Pennsylvania, and at Orange Court House, Va.

Orpheus, the semi-fabulous Grecian bard, recognised two kinds of gems which were symbolical of the sun. "In both," he says, "there appear rays shining straight, and like luminous hair, but the colours of the stones are different: the one would be deemed a crystal, the other a chrysolite, except for the hair." He also wrote: "Phœbus hath planted in both species a mighty spirit which gives glory and heroic beauty to whomsoever shall wear them with due understanding."

"Ay, there's the rub." Probably few of Orpheus' contemporaries had the necessary "due understanding."

That the sunstone was connected in the minds of ancient gem-engravers with Sol, is evident from a beautifully carved gem of this character discovered by C. W. King in the Marlborough collection of jewels, showing Sol driving three horses attached to his chariot through the heavens, thus marking this stone as that god's peculiar property.

How are the mighty fallen!

The stone which used to possess the miraculous powers ascribed to this; the gem which enjoyed the favour of princes, and the felicity of being lied about by writers whom we now term classical; the only jewel to which the ancients paid the compliment of bestowing upon it the names of their worshipped luminaries, is now a common stone, valuable only for the skill displayed in cutting it.

Let us recount its glories past, and draw the veil of charitable silence over its ignominious present.

Uranium.

IT is somewhat remarkable that this metal, which was originally discovered in 1789, should be re-discovered as it were at the present time, exactly 100 years afterwards. To many of our readers the very name of the metal will be altogether unknown, as on account of its extreme scarcity its application to the arts has hitherto been very limited.

As an oxide of the new metal it was originally discovered, and in this form some very rich samples of ores have been known to yield as high as 80 per cent., but these have been exceptional cases, and in small quantities. That recently discovered at the Union Mines, Grampound Road, Cornwall, shows a yield of from twelve to thirty per cent. of the true metal.

The ore is usually found in masses of pitch-blende like clustering grapes of a greenish or brownish colour, and more or less mixed with lead and silver ores, and almost invariably associated with sulphides and arsenides and other metallic compounds, so that to get at the pure metal is necessarily a most troublesome and expensive process.

To Klaproth belongs the honour of being the first to isolate from this dark mineral a yellow oxide, which he decided was an oxide of a new metal, and to it he gave the name "Uranium" in honour of the then newly-discovered planet Uranus. It was then classed amongst the very rare metals, and it still remains so. But strange as it may seem, Klaproth did not get at the pure metal. The world had to wait 50 years before this was extracted from the raw material. Klaproth could see that there was a metallic base, but failed to isolate it as a separate metal, and if to Klaproth belongs the honour of being the first to tell the world of the existence of the unknown metal, to Pêleglal, a Frenchman, belongs equal honour for being the first to isolate the true metal in 1840, and he at the same time determined its atomic weight, showing too that Klaproth's discovery was a protoxide of the real metal.

This mineral has been found in various parts of the world, but more especially in Bohemia, Saxony, Hungary, Connecticut, and in Cornwall. It is usually found in "pockets" and patches, but that recently discovered in Cornwall is not scattered about in this way, but presents itself as a rich vein or "true fissure vein," unique in the history of metals and believed to be the only known lode in the world. The lode traverses the mine from north to south, and the uranium occurs in it chiefly as a sesqui-oxide.

How continuous this vein may prove it is at present impossible to predict; but the prospects are good. Several tons of the ore have been raised and sold, and, as we have already said, it has yielded from 12 to 30 per cent. of the pure metal. This first lot that has been banked must have realised several thousand pounds in money, and is a matter of considerable importance to the fortunate owners of the mine.

On account of its scarcity, uranium commands a high market price, but still in no case does it come up to the price of gold or silver, though in the arts—as an alloy—it can be used with considerable advantage in some cases to take the place of the most precious of metals. At the present time it is worth about 21s. 6d. a lb., while gold is worth £3 17s. per oz., and silver say 50s. a lb. Though from these figures it will be seen that uranium is not nearly so valuable as silver or gold, yet its value is sufficiently high to make this recent "find" a matter of considerable importance, not only to the owners, but also to the mining and commercial world.

Hitherto it is not so much its cost as its rarity that has limited its more extensive use in the arts. It has been well known to chemists as a metal with some remarkable properties. But if it should continue to be found in sufficient quantities for industrial purposes no doubt a great future lies before this comparatively unknown metal. Still it is recorded that one mine alone in Bohemia yielded, in the one year of 1875, 70 cwt. of this "oxide," which represented a market value of about £8,500.

It was not until the year 1856—nearly 70 years after its discovery—that metallurgists were able to obtain the metal in a compact form. In this state it is somewhat valuable and hard, though it can be scratched with a steel point. Now, as gold and silver are amongst the most wasteful of metals for monetary purposes, being too soft to wear well and liable to "sweating"—either artificially or in the course of legitimate use between buyer and seller—it is just possible that they may come to be alloyed with uranium for the purpose of preventing this great waste.

Our readers are aware that silver is very low in price at the present time, and has been for some years. But some of them may not know that "coiners" can honestly (?) carry on their trade; that as a matter of fact they can make genuine silver half-crowns, equal to the Mint, at the rate of two for a little over three shillings. There is now no longer any need to use German silver for the purpose of defrauding the public.

In appearance uranium is like nickel or iron of a steel-white colour, but when exposed to the air it quickly tarnishes, and turns yellow. It is anticipated that the recent discovery in Cornwall will enable two important applications of the metal to be pursued. The first is as a substitute for gold in electro-plating, as like platinum and copper it forms two beautiful alloys both looking like gold, while the former has the additional advantage of resisting the action of acids. The second application is in connection with electric installation, as uranium possesses a very high power of electric resistance. If it comes to be available in larger quantities it will no doubt be extensively used in electric engineering.

The various oxides of uranium have long been employed in the arts, more especially in porcelain and glass work. Uranio oxide gives a beautiful golden or greenish-yellow tint to glass, while the uranous oxide is employed in producing the costly and highly-valued black porcelain; it yields the fine orange color in the enamelling furnace, and the jet black when the porcelain itself is baked. Urinate of soda forms yellow crystals, and is made commercially, being used for the production of yellow uranium glass, and it is also used for porcelain painting.

Uranium has also been found to be useful in photography, and various compounds of the metal are used us substitutes for the more costly chloride of gold. The nitrate is easily soluble in water, and this preparation is also used in some departments of photography. The powdery metal when heated to 150° or 170° catches fire and burns brilliantly.

A Limited Company has been recently formed, with a capital of £120,000, for the purpose of working this new vein which has been discovered in Cornwall.

Procuring Aluminum by Electrolysis.—Among those who have worked out the problem of procuring aluminum by electrolysis, Monsieur Minet is one of the most successful. The electrolyte used by him is a mixture of from 30 to 40 per cent. of cryolite, with from 60 to 70 per cent. of common salt. This mixture fuses at a comparatively low temperature, and does not volatilise as does the chloride of aluminum. In practice, an electro-motive force of above 5 volts. is required at the terminals of the bath, and one-third the weight of the cryolite is obtained as aluminum. As cryolite is comparatively expensive, M. Minet has invented a method in which the fumes of fluorine escaping from the bath are made to act upon alumina, or bauxite, which is thus converted into fluoride. With this arrangement to produce one part by weight of the metal, 1.5 parts of alumina fluoride, 2 of alumina, and one of common salt are required. In practice, one horse-power hour is required to produce $\frac{1}{2}$-lb. of aluminum, the theoretical yield being $\frac{7}{8}$-lb.

Rates of Chronometers on Trial for Purchase by the Admiralty, at the Royal Observatory, Greenwich,

From July 7, 1888, to January 26, 1889.

Name and Address of Maker.	No.	Whether 2 or 8 days.	Construction of Escapement and Balance, from the description furnished by the Maker.	ABSTRACT OF THE PRINCIPAL CHANGES OF RATE DURING THE 29 WEEKS.									
				Least Weekly Rate.	Extremes of Temperature.	Mean Temperature.	Greatest Weekly Rate.	Extremes of Temperature.	Mean Temperature.	Dif'rence between greatest and least. (a)	Greatest dif'rence between one week and the next. (b)	Mean Temperatures for these two weeks.	a + 2b.
				s	° °	°	s	° °	°	s	s	° °	
Kullberg, London	4915	2	Auxiliary; palladium spring: reversed detent	— 8·8	60·7 — 64·9	62·2	— 3·5	94·2 — 96·1	95·0	5·3	3·7	80·5 — 50·7	12·7
Uhrig, London	500	2	Uhrig's continually acting auxiliary	— 5·2	56·1 — 61·1 46·9 — 58·0	59·0 52·7	+ 0·9	94·2 — 96·1	95·0	6·1	3·8	52·7 — 80·8	13·7
Kullberg, London	4314	2	Auxiliary; palladium spring; reversed detent	— 5·1	59·2 — 68·8 84·3 — 86·1	63·7 85·3	+ 3·2	46·3 — 55·2	50·7	8·3	3·0	80·5 — 50·7	14·3
Penlington, Liverpool	2515	2	Auxiliary compensation	— 5·3	59·2 — 68·8	63·7	+ 4·3	94·2 — 96·1	95·0	9·6	4·0	65·7 — 63·7	17·6
Kullberg, London	4903	2	Auxiliary; palladium spring; reversed detent	— 8·5	45·5 — 56·6	49·8	— 1·2	96·0 — 98·2	97·1	7·3	6·0	80·8 — 95·2	19·3
Kullberg, London	4671	2	Auxiliary; palladium spring; reversed detent	— 13·9	59·2 — 68·8	63·7	— 4·5	80·0 — 81·4	80·5	9·4	5·7	95·0 — 80·5	20·8
Uhrig, London	499	2	Uhrig's continually acting auxiliary	— 2·9	96·2 — 97·9	97·0	+ 8·5	44·2 — 53·9	49·8	11·4	4·7	95·0 — 80·5	20·8
Hume, Newcastle-on-Tyne	2021	2	Auxiliary compensation	+ 3·8	80·0 — 81·4	80·5	+ 12·5	52·2 — 61·9	56·9	8·7	6·1	52·7 — 80·8	20·9
Webster, London	18122	2		— 11·2	45·5 — 56·6	49·8	— 3·4	80·0 — 81·4	80·5	7·8	7·1	80·5 — 50·7	22·0
Mann, Gloucester	4918	2	Auxiliary compensation	— 10·7	46·3 — 55·2	50·7	+ 0·6	84·3 — 86·1	85·3	11·3	5·8	80·5 — 50·7	22·9
Johannsen & Co., London	3827	2	Auxiliary compensation acting in heat	— 4·9	94·3 — 96·2	95·2	+ 5·7	52·2 — 61·9	56·9	10·6	6·4	95·0 — 80·5	23·4
Mercer, St. Albans	4827	2	Auxiliary compensation	+ 4·7	56·1 — 61·1	59·0	+ 19·4	46·9 — 58·0	52·7	14·7	6·1	80·8 — 95·2	26·9
Uhrig, London	511	2	Uhrig's continually acting auxiliary	— 11·9	56·1 — 61·1	59·0	+ 6·0	45·8 — 55·8	50·2	17·9	4·6	97·1 — 97·0	27·1
Wells & Son, Newport	2903	2	Improved compensation balance	— 3·3	59·5 — 76·6	65·7	+ 13·4	94·2 — 96·1	95·0	16·7	5·4	95·0 — 80·5	27·5
Isaac, London	1879	2	Palladium balance spring	+ 4·5	62·1 — 65·6	63·4	+ 17·1	46·3 — 55·2	50·7	12·6	7·5	48·5 — 50·2	27·6
Isaac, London	1780	2	Solid auxiliary balance	— 4·4	48·9 — 59·9	53·8	+ 9·1	80·0 — 82·0	80·8	13·5	8·4	80·8 — 95·2	30·3
Sewill, London	4518	2	Auxiliary compensation	— 3·0	84·3 — 86·1	85·3	+ 13·6	45·8 — 55·8	50·2	16·6	7·6	80·5 — 50·7	31·8
Usher & Cole, London	6517	2	Auxiliary acting in heat and cold	— 16·9	62·1 — 65·6	63·4	+ 5·5	45·8 — 55·8	50·2	22·4	4·9	52·7 — 80·8	32·2
Sewill, London	4516	2	Auxiliary compensation	— 17·0	58·8 — 64·0	61·0	— 0·2	96·2 — 97·9	97·0	16·8	8·0	85·1 — 60·3	32·8
Tainsh Bros., Cardiff	$\frac{2}{3000}$	2	Auxiliary acting in heat and cold	— 8·9	58·2 — 63·2	60·3	+ 7·3	80·0 — 82·0	80·8	16·2	8·4	80·5 — 50·7	33·0
Hume, Newcastle-on Tyne	2018	2	Auxiliary compensation	— 10·6	80·0 — 81·4	80·5	+ 9·6	48·6 — 61·8	54·8	20·2	6·6	52·7 — 80·8	33·4
Usher & Cole, London	6507	2	Auxiliary acting in heat and cold	— 9·0	60·7 — 64·9	62·2	+ 13·8	41·6 — 54·3 45·8 — 55·8	48·5 50·2	22·8	6·4	61·4 — 85·3	35·6
Glover, London	366	2	Ordinary balance with auxiliary acting in heat	— 14·2	46·3 — 55·2	50·7	+ 4·0	58·8 — 64·0	61·0	18·2	9·2	80·8 — 95·2	36·6
David Reid, Newcastle-on-Tyne	850	2	Auxiliary compensation	— 18·9	94·3 — 96·2	95·2	— 2·6	44·2 — 53·9	49·8	16·3	12·1	80·8 — 95·2	40·5
Keys, London	884	2	Auxiliary compensation	— 7·8	96·0 — 98·2	97·1	+ 11·0	45·8 — 55·8	50·2	18·8	10·9	80·8 — 95·2	40·6
Blair, Bristol	1887	2	Auxiliary compensation	— 32·9	46·3 — 55·2	50·7	— 11·6	62·1 — 65·6	63·4	21·3	9·7	80·5 — 50·7	40·7
Johannsen & Co., London	3792	2	Auxiliary compensation acting in heat	+ 3·6	56·1 — 61·1	59·0	+ 25·0	48·6 — 61·8	54·8	21·4	9·7	57·1 — 58·6	40·8
Keys, London	888	2	Improved balance	— 3·1	52·4 — 62·9	57·8	+ 15·2	80·0 — 82·0	80·8	18·3	11·3	52·7 — 80·8	40·9
Kendal & Dent, London	4636	2	Auxiliary to balance, palladium spring	— 2·1	84·3 — 86·1	85·3	+ 13·7	41·6 — 54·3	48·5	15·8	13·3	80·8 — 95·2	42·4
Reid & Sons, Newcastle-on-Tyne	867	2	Auxiliary compensation	— 11·6	58·2 — 63·2	60·3	+ 8·8	45·8 — 55·8	50·2	20·4	11·4	80·5 — 50·7	43·2
Johannsen & Co., London	3841	2	Auxiliary compensation acting in heat	— 9·1	96·0 — 98·2	97·1	+ 10·1	46·9 — 58·0	52·7	19·2	12·1	52·7 — 80·8	43·4
Mann, Gloucester	4603	2	Ordinary balance	— 10·9	94·3 — 96·2	95·2	+ 3·8	80·0 — 82·0	80·8	14·7	14·7	80·8 — 95·2	44·1
Edward & Sons, Glasgow	4936	2		— 26·6	41·6 — 54·3	48·5	— 0·6	58·8 — 64·0	61·0	26·0	10·4	85·3 — 97·1	46·8
Isaac, London	1785	2	Ordinary balance with slight additions	— 14·2	41·6 — 54·3	48·5	+ 4·0	80·0 — 81·4	80·5	18·2	14·4	80·5 — 50·7	47·0
Wells & Son, Newport	2853	2	Improved compensation balance	— 4·0	94·2 — 96·1	95·0	+ 16·3	46·9 — 58·0	52·7	20·3	13·4	52·7 — 80·8	47·1
Pyott, London	886	2	Ordinary balance, with auxiliary	— 7·1	41·6 — 54·3	48·5	+ 10·9	80·0 — 82·0	80·8	18·0	15·3	80·5 — 50·7	48·6
Blair, Bristol	1888	2	Auxiliary compensation	— 9·1	96·0 — 98·2	97·1	+ 9·9	45·8 — 55·8	50·2	19·0	15·0	52·7 — 80·8	49·0
Penlington, Liverpool	2517	2	Auxiliary compensation	+ 1·7	47·0 — 57·2	54·2	+ 24·2	80·0 — 81·4	80·5	22·5	13·3	85·1 — 60·3	49·1
Kendal & Dent, London	4465	2	Ordinary balance; palladium spring	— 12·9	48·6 — 61·8	54·8	+ 15·3	96·2 — 97·9	97·0	28·2	12·5	85·3 — 97·1	53·2
Mercer, St. Albans	4824	2	Auxiliary compensation	— 7·5	96·0 — 98·2	97·1	+ 14·7	48·9 — 59·0	53·8	22·2	15·9	80·8 — 95·2	54·0
David Reid, Newcastle-on-Tyne	1788	2	Auxiliary compensation	— 17·4	80·0 — 82·0	80·8	+ 2·6	45·8 — 55·8	50·2	20·0	19·9	52·7 — 80·8	59·8
Brockbank & Co., London	2063	2	Auxiliary compensation	— 16·3	94·2 — 96·1	95·0	+ 10·3	80·0 — 82·0	80·8	26·6	25·9	80·8 — 95·2	78·4
J. Poole & Co., London	5812	2	Poole's auxiliary	— 23·2	56·1 — 61·1	59·0	+ 18·0	80·0 — 81·4	80·5	41·2	26·1	80·5 — 50·7	93·4
Pyott, London	902	2	Ordinary balance, with auxiliary	— 1·3	62·1 — 65·6	63·4	+ 42·4	80·0 — 81·4	80·5	43·7	34·8	80·5 — 50·7	113·3
Heap, London	7591	2	Auxiliary for cold, Airy's compensation	— 28·9	47·0 — 57·2	54·2	+ 29·6	84·3 — 86·1	85·3	58·5	27·9	52·7 — 80·8	114·3
J. Poole & Co., London	5814	2	Poole's auxiliary	— 13·9	62·1 — 65·6	63·4	+ 75·0	80·0 — 81·4	80·5	88·9	35·0	80·5 — 50·7	158·9
Glover, London	280	2	Ordinary balance, with auxiliary acting in heat	— 10·8	94·3 — 96 2	95·2	+ 61 7	41·6 — 54·3	48·5	72·5	50·9	80·8 — 95·2	174·3

The sign + indicates that the rate is gaining.

The Chronometers are placed in order of merit, their respective positions being determ'ned by consideration of the irregularities of rate exhibited in the Table above.

Royal Observatory, Greenwich.

ANNUAL TRIAL OF DECK WATCHES,

Nov. 24, 1888 to Feb. 16, 1889.

Order.	Name.	No.	Diff'nce between greatest & least weekly rates. Dial up. (a)	Greatest diff'ence between one wk. and the next. Dial up. (b)	Difference of weekly rates: Pendant up. — Dial up. (c)	Pendant r. — Dial up. (d)	Pendant l. — Dial up. (e)	Trial No. $a+2b+\frac{1}{2}\left(c+\frac{d+e}{3}\right)$
			s.	s.	s.	s.	s.	s.
1	Isaac	10811	19·9	10·3	— 12·7	— 20·5	— 41·8	57·3
2	Usher and Cole	25314	14·6	14·6	+ 22·3	+ 2·9	— 11·1	57·5
3	Isaac	10814	22·8	7·3	— 14·0	— 30·0	— 52·2	58·7
4	Buckney	30403	23·0	16·3	+ 16·9	+ 6·3	+ 3·3	65·7
5	Buckney	30401	17·6	17·6	+ 12·5	+ 39·8	+ 5·2	66·6
6	Brockbank and Co.	214	22·1	17·9	+ 15·4	+ 21·2	+ 1·4	69·4
7	Klean and Co.	62110	20·6	13·2	— 28·1	+ 44·7	— 20·8	72·0
8	Isaac	10820	34·1	9·2	+ 12·4	+ 62·0	+ 24·9	73·2
9	Buckney	30199	21·9	21·9	— 4·2	+ 25·2	— 32·2	77·4
10	J. Poole and Co.	5605	32·0	11·7	— 33·7	— 18·3	— 33·5	80·9
11	Hall	3003	31·9	17·0	+ 21·5	+ 18·3	+ 17·5	82·6
12	Usher and Cole	25261	26·3	24·3	— 13·0	— 2·8	— 24·3	85·9
13	Buckney	30200	23·9	17·7	+ 28·2	+ 28·2	+ 48·2	86·1
14	Buckney	30398	29·1	16·9	+ 18·3	+ 59·8	+ 25·3	86·3
15	Ashley	3757	33·5	25·3	— 1·6	— 11·2	— 12·4	88·8
16	Ashley	3621	29·9	28·0	+ 3·7	— 3·8	— 4·2	89·1
17	Kendal and Dent	24175	44·7	22·5	+ 16·8	— 8·3	— 7·8	100·8
18	Isaac	10795	29·2	26·4	+ 10·6	+ 48·9	— 36·7	101·6
19	Player	25451	39·1	26·3	+ 9·4	— 14·1	+ 25·4	103·0
20	Brockbank and Co.	213	60·5	11·7	+ 16·7	+ 31·2	+ 36·5	103·6
21	Buckney	30202	33·3	27·9	— 20·4	+ 30·5	— 49·0	111·7
22	J. Poole and Co.	6424	34·6	34·6	— 6.6	+ 13·9	— 19·9	112·7
23	Buckney	30402	44·8	34·0	— 13·7	+ 33·7	+ 17·9	128·3
24	Klean and Co.	62111	38·8	35·7	+ 20·5	+ 48·6	+ 1·2	128·8
25	Kendal and Dent	25450	39·6	27·6	+ 22·1	×132·2	+ 52·6	136·7
26	Brockbank and Co.	74212	65.2	36·7	— 8·5	— 3·1	+ 10·6	145·2
27	Player	25454	56·0	15·0	—116·5	+ 48·2	— 8·0	153·6
28	Hall	3071	48·5	43·5	— 23·2	+ 9·3	— 56·6	158·1
29	Player	25452	65·4	33·9	— 38·7	+ 73·7	— 74·0	177·2
30	Buckney	30400	51·9	51·9	+ 17·6	+ 29·1	+ 71·8	181·3
31	J. Poole and Co.	6456	117·2	85·0	+ 27·6	+121·2	+ 14·1	303·6
32	Hall	3651	135·4	117·4	+ 1·6	+ 7·2	— 18·3	375·3

+ Denotes gaining. — Denotes losing.

The quantities a, b, c, d, e, in the formula, $a+2b+\frac{1}{2}\left(c+\frac{d+e}{3}\right)$ are taken numerically, without regard to sign.

W. H. M. CHRISTIE.

Royal Observatory, Greenwich.

The English and Australian Copper Company.

The ordinary general meeting of the shareholders of this company was held on November 5 at the Cannon Street Hotel, Mr. J. Harvey (the chairman) presiding. The chairman, in moving the adoption of the report and accounts, said the predictions he ventured to make when they last met together had not been verified. Instead of asking them to receive a dividend, as they then anticipated with very good reason, he was there to explain a serious loss on the year's trading. First of all, they had a strike among the colliers at Newcastle, then the next difficulty which they had to meet was the question of the manager. In making up the stocks at the end of the year a serious error, amounting to something like £2,450, was discovered to have been made in the valuation of the silver ore on June 30. After serious consideration, the board decided that one of their number should proceed to Australia to go into the whole matter, and Mr. Cuff was kind enough to put aside his own private business and volunteer to go. Ere he could leave, however, it came to the knowledge of the board that Mr. Trewenack had been receiving assay fees, against the terms of his agreement, and had been pocketing discounts on goods supplied to the company. They immediately dismissed him by cablegram, and the result of it was that he brought an action against the company for wrongful dismissal. Thanks to Mr. Cuff's assistance, they succeeded in defeating him. The company commenced the experiment of silver smelting last year, and there was no doubt that, although the profits amounted only to a few hundred pounds, had the manager given the necessary time and attention to securing regular supplies of silver ore, they would have made a very good profit indeed. Mr. Cuff wrote to say that he had made arrangements for the purchase of silver ore, and that now supplies were coming in freely. A more serious matter was the loss on copper. Having referred to the collapse of the copper ring, he went on to say that Mr. Cuff had gone carefully into all the details of the business at Newcastle and Port Adelaide, and had also visited the other properties of the company. The board were advised that he would return about the end of the year, and it was their intention to ask the shareholders to meet him early in the ensuing year. At the present moment they were making a profit in the business, but they thought any discussion with reference to the future operations of the company should be deferred until after Mr. Cuff had laid his views before them. Mr. W. O. Robinson (deputy chairman) seconded the adoption of the report, stating that the board had sufficient funds in hand to carry on the business profitably so long as prices were maintained. After some discussion, the report was adopted.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

16,604. M. Deines, W. von Wolfframsdorff, and C. Otto, London, for "An improvement in safety devices for retaining watches in pockets." Dated October 21, 1889.

16,727. H. Sulley, Birmingham, for "Eyelet for pearl studs and solitaires together, to be made in gold, silver, and other kinds of metal. Dated October 23, 1889.

17,080. F. Redman, London, for "Improvements in clocks for advertising and other purposes." Dated October 28, 1889.

17,095. S. McNamara, London, for "Improvements in devices for operating regulators for watches and clocks." Dated October 29, 1889.

17,165. T. Baxter, London, for "Universal joint tool for removing the joint pins from watch movements and jewellery articles, with plier and nipper combined." Dated October 30, 1889.

17,364. G. F. Kohler, London, for "Improvements in the manufacture of diamond tools for cutting precious stones." Dated November 1, 1889.

17,463. J. Oulton and J. Edmondson, Halifax, for "Improvements in clocks and timepieces." Dated November 4, 1889.

17,803. J. Munro and J. Pollock, Glasgow, for "The improvement of watch (and other pocket time-keeper) cases." Dated November 8, 1889.

17,910. W. Potter, London, for "A new or improved spring clip for holding and displaying finger rings, bangles, and other small articles, and for other like purposes." Dated November 8, 1889.

18,060. R. H. Franklin, London, for "Improvements in adjustable watch keys and holding tools." (Complete specification). Dated November 12, 1889.

18,289. J. Calderwood, London, for "Improvements in illuminated timepieces." Dated November 15, 1889.

Recent American Patents.

Art of forming Sheet Metal Articles. A. W. Pauli	413,372, 413,373, 413,374
Bouquet Pin. W. A. Brunka	412,883
Buckle. J. Gump	413,052
Buckle. G. L. Smith	413,375
Buckle. C. W. Bassett	413,382
Button. L. C. H. Mensing	413,198
Buttoner. T. W. G. Cook	413,034
Button for Sleeves, &c. Marie Dehayes	413,315
Button Hook. T. R. Betzel	413,314
Button Hook. T. R. Betzel	413,334
Button or Stud. A. Rammoser	413,763
Calendar Watch. B. Rosenburg	412,796
Chain Bar. J. H. Fanning	413,439
Clock Case. Florence Kroeber	413,235
Coffee Pot. G. M. Florer and C. W. Moyer	412,739
Combination Walking Cane (makes, when taken to pieces, drinking cup, whistle, and fan). W. Flam and A. G. Brandt	412,379
Combined Match Safe and Ticket Holder. S. Wolerstein	413,006
Cuff Fastener. H. C. Frank	413,441
Electric Pendulum Driven Clock. M. L. M. Hussey	413,281
Electric Regulator for Pendulum Clocks. J. H. Gerry	413,340
Enamellers' Apparatus. S. D. Kerne	412,853
Eyeglasses. A, A. Cowing	414,106
Eyeglasses. J. Currin	412,239
Eyeglasses. W. S. Wells	412,442
Fork Guard. A. Copley	413,359
Garment Support. C. R. Arnold	413,772
Garment Supporting Clasp. F. A. Richardson	413,792
Handle for Metallic Vessels. W. C. Leavitt	412,763

Hollow Metallic Handles (Making). J. E. Moody	412.777
Inkstand. E. Davis	413:390
Key Holder. C. E. Van Norman	413,421
Lathe Attachment for making metal screws. J. N. Severance	413,870
Micrometer Callipers. C. P. Jennings	413.516
Opera Glass Holder. E. B. Meyrowitz	412,774

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

Gazette.

PARTNERSHIPS DISSOLVED.

C. Hollis and Son, Birmingham, electro-platers. Christie, Manson, and Woods, St. James's, auctioneers. Joseph Rodgers and Co., Sheffield, cutlery manufacturers. Barnett and Scott, Kingston-upon-Hull, jewellers. Davies and Sons, Carmarthen, jewellers.

THE BANKRUPTCY ACT, 1883.

RECEIVING ORDERS.

Marsh, Walter Thomas, Watford, watchmaker.

ADJUDICATIONS.

J. McGrath, junr., High Holborn, jeweller. M. E. Goldstein, Hatton Garden, diamond merchant. W. T. Marsh, Watford, watchmaker.

NOTICES OF DIVIDENDS.

M. Tannenberg and N. Tannenberg (trading as Tannenberg and Sons), Leeds and Newcastle-on-Tyne, jewellers, $5\frac{5}{16}$d., first and final; Official Receiver, Leeds. N. Tannenberg (separate estate), $10\frac{3}{4}$d., first and final; Official Receiver, Leeds. D. C. Ingram, Penzance, jeweller, 1s. $6\frac{7}{8}$d., first and final; Official Receiver, Truro. A. Bishton (trading as Bishton and Fletcher), Birmingham, manufacturing jeweller, 1s. 2d., second; 120, Colmore Row, Birmingham. F. Bailey, Market Terrace, Wood Green, jeweller, 1s. $5\frac{1}{2}$d., second and final; December 2, 28, and 29, St. Swithin's Lane, E.C. J. Bate, York, watchmaker, 1s. 3d., first and final; 28, Stonegate, York.

The Deeds of Arrangement Act, 1887.

DEVON.

Kennett, Arthur, 35, Tavistock Road, Plymouth, jeweller. Trustee, Samuel Hugh Duff, Plymouth, accountant. Unsecured Liabilities, £204 16s. 8d. Estimated Net Assets, £35. Deed of Composition dated October 21, 1889; filed October 25, 1889.

LANCASHIRE.

Hacking, Robert Bertwistle, Lambeth Buildings, Lambeth Street, and 84, Alton Street, Blackburn, jeweller. Trustee, Thomas Waterworth, 68, Victoria Street, Blackburn, C.A. Unsecured Liabilities, £70 4s. 10d. Estimated Net Assets, £115. Deed of Composition dated October 29, 1889; filed October 30, 1889.

Sharples, Richard, and Sons, 1, Lord Street, Blackburn, watchmakers and jewellers; partners—Richard Sharples, 57, Charlotte Street, Blackburn, and Thomas Sharples (deceased), late of Carlton Terrace, Parker Street, Blackburn (by Administratrix, trading as). Trustee, George G. Poppleton, Temple Row, Birmingham, C.A., and another, with a Committee of Inspection. Unsecured Liabilities, £1,963 4s. 5d. Estimated Net Assets, £1,824 5s. 3d. Creditors fully secured, £1,250. Deed of Composition dated November 4, 1889; filed November 9, 1889.

MONMOUTH.

Greening, Joseph, 2, High Street, Chepstow, watchmaker and jeweller. Trustee, James S. Pitt, 15, St. John's Street, Bristol, C.A., with a Committee of Inspection. Unsecured Liabilities, £441 16s. 5d. Estimated Net Assets, £250. Creditors fully secured, £18 5s. Deed of Composition dated November 15, 1889; filed November 21, 1889.

NORTHUMBERLAND.

Wood, James (Jun.), 19, Bridge Street, and 44, Stanley Street, Blyth, watchmaker and jeweller. Trustee, Joseph Mitcheson, Blyth, accountant, with a Committee of Inspection. Unsecured Liabilities, £304 18s. 4d. Estimated Net Assets, £290 4s. Deed of Composition dated November 15, 1889; filed November 22, 1889.

BANKRUPTCY.

Re R. Sharples and Sons, watchmakers and jewellers, Blackburn.—A meeting of the creditors of this firm was convened by Messrs. Withers and Hargreaves, solicitors, Blackburn, and held at the offices of the Wholesale Traders' Association, Temple Row, Birmingham, on the 24th day of October, 1889, and a statement of affairs prepared by Mr. Waterworth, chartered accountant, Blackburn, was presented to the meeting, showing liabilities £1,937 15s. 10d., and assets £1,798 16s. 8d. A large number of creditors were present. It appeared one of the partners had recently died, and the survivor, finding himself unable to carry on the business, placed the affairs of the firm in the hands of their creditors, without making any proposal of composition or otherwise, and the meeting, after hearing a full explanation as to the position, unanimously resolved that a deed of assignment should be executed, for the benefit of the general body of creditors, to Mr. G. G. Poppleton, C.A., general manager of the Wholesale Traders' Association, and Mr. William Ehrardt, of Birmingham, watch manufacturer, as trustees, with three of the principal creditors as a committee of inspection.

CORRESPONDENCE

All Letters for Publication to be addressed to the EDITOR *of* THE WATCHMAKER, JEWELLER, AND SILVERSMITH, 7, *St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller, and Silversmith.*

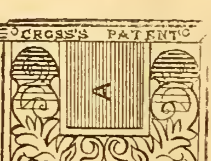
Can any of your subscribers give me trustworthy information with regard to a Dr. Menist; replies from wholesale opticians acquainted with *facts* will be particularly acceptable, as it is intended to expose an impudent fraud.

1. Does or has Dr. Menist ever manufactured spectacles?

2. If he does, are his spectacles in any way superior to those made by any known London maker.

3. If a firm sells spectacles said to be made by Dr. Menist, but are *not* made by him, are they punishable under the Merchandise Marks Act, or simply for selling goods under false pretences?

ANTI-HUMBUG.



DIRECTIONS FOR

Walter Cross & Co.'s Patent Self-Acting Book-marker.—Open the Book, place the clip A on the right-hand cover so that the square part A comes on the inside, and projecting part C comes on the outside of cover, then lift indicator B to first page of Book, as indicated in Fig. 1.

N.B.—The Marker acts best if Indicator is placed from about half-an-inch to an inch from top of page, just above print.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. THE WATCHMAKER, JEWELLER AND SILVERSMITH will be found an exceptional medium for advertising. Special Notices, Situations, &c., per insertion, 1s. for two lines, prepaid.

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409, George Street, Sydney.

EDITORIAL

"TIME that flies like a dream and dies as dreams that die with the sleep they feed," says Algernon Chawles. January, 1890? How time flies! will be the expression of many a one who (not realising that we have another nail in our coffins) have dated their correspondence 1889. That we have entered into the New Year, every time we have done so, is a fact that, nevertheless, has to be acknowledged, and which is continually brought home to us forcibly every day we advance further into it, by reminders of the financial liabilities incurred during the year that's awa'—and, not infrequently, before. However, it is a comfort to know that the said liabilities will not be this time so difficult to meet by the cognate trades we represent, as they were on some former occasions within the memory of the oldest inhabitant.

Reports from correspondents in different parts of the country have, during the past twelve months, consistently confirmed what some persons were unkind enough to term our optimistic views (good old optimism) with regard to last year's trade prospects, and it is satisfactory to observe and record that there is at the present time no appearance of any falling off in the volume of trade taking place in the immediate future. In fact, confidence in a continuance of the present busy times seems to be fully and firmly established. May it long continue, for by confidence are begotten: Enterprise, Business, and Prosperity.

In that hope we wish our readers a Happy and Successful Year and all the Compliments of the Season.

General Notes

The Coventry Watch Movement Company.—Next month the Coventry Watch Movement Company will begin work in their new factory.

The Lancashire Watch Company.—The new works of this company are to be opened on the 11th instant, at 3 p.m., by Lord Derby.

The second "Birthday Souvenir," as the publishers call it, of the New York *Jewellers' Weekly* comes to us this year in more brilliant plumage than the first (issued last year). It is full of Christmastide literature (which those endowed with vivid imaginations can imagine, has some connexion with the jewellers' craft), crowded with advertisements, and is typographically and otherwise a work of which the proprietors may well be proud.

Reported Discovery of Diamonds.—A Melbourne advice states that what is believed to be an important discovery of diamonds has been made near Bairnsdale by a farmer named O'Mara. O'Mara was prospecting for gold, and, at the depth of about twelve feet, struck a small vein of sand full of hard pebbles and vegetable fibre, the stones found being pronounced by experts to be diamonds. The strata in the vicinity is hard and sandy, with no large gravel or loose stones of any kind.

There has been a good deal of dissatisfaction, says the *Jewellers' Circular*, with the awards at the Paris Exposition, as might be expected. One or two meetings of dissatisfied exhibitors have been held at Paris, but their prolonged discussions have resulted in little except expressions as to the incompetence and favouritism of the jurors, and the drafting of resolutions recommending the abolition of jurors and awards at future exhibitions, and the substitution of a simple commemorative medal for all participants.

Embezzlement at Hull.—At the Hull Police-court last month, Henry Coultas, a middle-aged man, was charged on remand, with having embezzled £2 15s., the moneys of Mr. F. Larard, silversmith, &c., Savile Street. Mr. Spink, who prosecuted, said there were several charges against the prisoner, but they would proceed on one only. Prisoner was employed as commission agent by Mr. Larard, and his duty was to sell articles and receive payment. He sold a watch to a Mr. Halliway, and received £3 15s., but only paid £1 10s. to prosecutor, whom he led to believe the watch would be paid for by instalments. Altogether about £25 had been embezzled. Committed for six months.

Coventry Watchmaking.—The Kew Observatory Committee have issued the horological report for the past year, which shows that Coventry is making advancement in the higher grade of scientific work. A list is published of the 26 best watches, *i.e.*, those which have taken highest marks. Four of these were made by Mr. Fridlander, who gained 89 marks with one watch; three by Mr. Joseph White, who obtained 84·5, 83·5, and 82; two by Messrs. Rotherham and Sons, with 83·8 and 83·7. Mr. Fridlander again heads the list for minutes and seconds chronograph repeaters with 81·5; also for minute and seconds chronographs with 81 marks. Messrs. Newsome and Company have taken 62·7 with an ordinary seconds chronograph.

A Watch Warranty Question.—Mr. Lyons, of Lamb's Conduit Street, W.C., was on November 29 last the plaintiff at the Westminster County Court in a case involving the question of a watch warranty. The defendant, a journalist, admitted the plaintiff's claim, but submitted that as the watch was warranted for two years and went wrong while in his possession with fair usage that he was justified in withholding payment; he counterclaimed for the value of the watch. Then came the question, What does "warranted" mean? and after evidence on both sides being put in, Judge Bayley thought a breach of warranty was not proved, and gave a verdict for plaintiff on claim and counterclaim.

A New Wheel-making Machine.—W. W. Hastings, superintendent of the New York Standard Watch Company's Factory, recently patented a machine that will, it is said, radically change the processes of clockmaking. By a perfectly automatic process, requiring no other attention than to be set to the required gauge and fed, the machine will cut the pieces of metal to their proper size and then cut the teeth, dropping the wheels, finished and ready for the clock, to the work-bench below. The machine is but about three feet long, and is compactly built, in a strong and durable manner. Mr. Hastings was formerly connected with the Waltham Watch Company, and has just finished one of the machines for them. It can be seen working at the Standard factory.

A 2,000-year-old Necklace.—Messrs. Dickie and Paul, solicitors, Dundee, received a telegram last month, from Messrs. Macpherson and Mackay, W.S., Edinburgh, stating that the Crown insisted on the delivery of the necklace, urn, pin, and knife, which are at present in the possession of Messrs. Dickie and Paul, as the agents of the trustees of the late Mr. Sturrock. The articles were found by Mr. Sturrock several years ago on the estate of the Earl of Home. A short time after Mr. Sturrock's death his antiquities were advertised for sale in Edinburgh, when an action was raised by the Earl of Home for the possession of the necklace, which is supposed to be 2,000 years' old, and the other articles, on the ground that they were found on his estate.

Compasses in the Royal Navy.—In reply to an inquiry by the Committee of Lloyd's, the Secretary of the Admiralty states, says the *Shipping Gazette*, that no new form of compass has been adopted in her Majesty's ships. Improvements have, however, recently been made in the liquid compasses, with a view to making them more effective in every respect, and capable of withstanding the shocks of heavy ordnance, and abnormal vibrations of the bridges of ships caused by powerful engines. These compasses are fitted with an azimuth circle, especially intended for taking bearings at night, and in thick or rainy weather, and are now on trial. The makers of the liquid compass are Messrs. Dent and Co., of 61, Strand. It is the intention of the Admiralty to adopt Thomson's compass.

Sir Morell Mackenzie's Pin.—Sir Morell Mackenzie, says a contemporary, often wears a notable pin, which has a curious history. It is in diamonds forming the figure 50, surrounded by a crown set in pearls. It is one of a few identical in value and design that the Queen had made in celebration of her Jubilee year. She presented one to each of her children, their husbands, and their wives. The late Emperor Frederick, then Crown Prince, received one, and greatly prized it. When he died the Empress sent it to the English physician, with a note saying she would like him to keep and wear it, since it had been peculiarly precious to her husband. Thus, as far as Royalty is concerned, the pin has a treble association—with the Queen, with the late Emperor of Germany, and with his widow.

The Divisions on the Watch Dial.—In *Queer Questions and Ready Answers*, Mr. S. Oliphant asks: "Why are clock and watch-dials divided into twelve divisions of five minutes each?" We have 60 divisions on the dials of our clocks and watches because the old Greek astronomer, Hipparchus, who lived in the second century B.C., accepted the Babylonian system of reckoning time—that system being sexagesimal. The Babylonians were acquainted with the decimal system, but for common or practical purposes they counted by *sossi* and *sari*, the *sossos* representing 60, and the *saros* 60 times 6—360. From Hipparchus that mode of reckoning found its way into the works of Ptolemy, about 150 A.D., and hence was carried down the stream of science and civilisation, and found its way to the dial plates.

New Book.—*A Handbook of Precious Stones* is the title of a little work we have just received from the author, Mr. M. D. Rothschild, of New York and London. The object of the book, as stated in the preface, is to convey to the merchant, the workman and the amateur, in a condensed and accurate form, information concerning the various properties of precious stones. The author admits to having drawn freely on a number of authorities, but has used his own practical experience to facilitate an amateur understanding the subject. The properties of stones as to hardness, specific gravity, etc., are dealt with in a readable form, the stones treated being principally such as are used in commerce for jewellery and ornamentation. Many of the newly-discovered stones of the United States suitable for the jeweller's art, are described in the book, which is a distinct accession to the literature of the craft.

During the past month the police have shown a commendable amount of activity in various parts of the metropolis, in raiding and securing both the thieves and the receivers of stolen property. This is the busy season with these gentry, who have lately become a perfect pest to society, and a constant source of anxiety to all who hold stocks of valuable property. Recent unsettlements in the labour market have evidently produced a large accession to the ranks of this class of offenders, who with improved trade prospects, do not appear to show any signs of a desire to return to the paths of truth and righteousness—when not in prison, they seem to have no other resources than those of thieving, burgling, or receiving, and every case in which one or more of them is "lagged," or a gang broken up, should prove a source of joy to the honester part of the community.

Promotion of Mr. Edward Rigg, M.A.—The following notice appeared in the *London Gazette* of December 3 :—"*Mint.* Edward Rigg to be Chief Clerk." Mr. Rigg will be best known to most of our readers as joint translator with Mr. Julian Tripplin, of Saunier's Horological Works. He has been the official examiner in Watch and Clockmaking to the City and Guilds' Institute since its foundation in 1880, and was one of the committee charged with the organisation of the classes of the Horological Institute when they were started. Mr. Rigg, who has been in the Civil Service since leaving Oxford in 1873, has worked hard in the various assaying departments of the Mint, and has thoroughly earned his present position there, while his contributions to the science of horology, by his Cantor lectures, translations, and other work, have been of immense benefit to watchmaking.

Japanese Art.—The tendency of the Anglo-Saxon civilization to override and crush out other civilizations with which it comes in contact is noticeable in the evident decay of native Japanese art. Since the introduction of European methods and ideas into that country, the native artists seem to have lost their cunning. They have forsaken native traditions, and now content themselves with a lame imitation of foreign models, or a feeble repetition of stereotyped forms. The Japanese exhibit at the Paris Exposition showed clearly the present degeneracy of this beautiful school of art. The ravages of a conquering civilization are ruthless and complete. While it gives much to compensate for what it displaces or destroys, yet one of the things which must cause deepest regret is the swallowing up of a matured national art by the greater virility of the invader. We have learned many lessons from the Japanese, particularly in the line of silverware and ceramics, and it might be well for us to hold fast to what we have acquired, for it is extremely doubtful whether they will teach us anything more.

A supplement to the *Journal Suisse d'Horlogerie*" contains the announcement, that with a view to the development of the beautiful watch manufacture of which Geneva has always had the monopoly, the Section of Commerce and Industry of the Society of Arts of Geneva, will open an essay competition upon the subject and watch parts as follows :—(*a*) gilding, silvering, nickelling, polishing, and other analogous means of restoring the plates and bridges ; (*b*) gilding and polishing of watch wheels ; (*c*) The preparation of plates and bridges with a view to the gilding and polishing (finish of the angles, hollows, and polishing) ; (*d*) The finish of steel pieces, such as ratchets, springs, wheels, screws, etc. The function of this competition will be to further horology in all that pertains to technical and and artistic progress. The competition being limited to the Geneva watch, the inhabitants of that canton only are entitled to compete. The prize essays will remain the property of their authors, and any new processes or inventions described will not be made public at the wish of the authors. The awards will consist of diplomas, which may be accompanied by silver or bronze medals should the works be of sufficient merit.

Receiving Stolen Watches.—Phineas Lazarus and Henry Defries were indicted before the Recorder for feloniously receiving several watches, value £50, knowing them to have been stolen. Mr. C. Matthews and Mr. C. F. Gill prosecuted, and Mr. Purcell and Mr. Geoghegan defended. The prisoner Lazarus carried on business as a dealer in Leman Street, and both prisoners were on friendly terms. They were apprehended by Inspector Leach on November 7, and a quantity of valuable jewellery and pawnbrokers' duplicates for similar property, the produce of various robberies, were found in Lazarus's possession. The evidence against Defries merely consisted of proof that he had pawned some of the articles. On examination of the watches it was found that the names and numbers had been skilfully removed, so as to prevent identification. The defence of Defries was that he had been merely a dupe in the affair, and on behalf of Lazarus it was argued that there was no evidence that he was aware the articles that were found had been stolen. The jury convicted both prisoners, but recommended Defries, who had received a good character, strongly to mercy. Lazarus was sentenced to five years' penal servitude, and Defries was discharged upon his entering into a recognisance to appear and receive judgment if called upon to do so.

The Diamond Market and Metals.

The Diamond Market.—Small consignments and few buyers would very well summarize the state of the diamond market (not only in London but elsewhere) towards the end of the year, as both Jew and Gentile have something to celebrate at this season. But this time there has been other causes, apart from the season, to account for the state of the market. These causes are mainly attributable to the "cornering" and gambling, which make the provision of stones so uncertain that polishers are afraid to speculate, and not to the output from the mines, which might be regulated to within very small fluctuations.

The steamer "La Bourgogne" left Havre on December 7th for New York with fifteen large parcels ; it is still the Americans who are the Parisian's best customers.

One of the Union Company's steamers left the Cape on the 11th ult., and was expected to arrive at Southampton on the 31st.

Metals.—Markets continue active. The latest official quotations are as follows :—*Silver.*—Bars steady at $43\frac{7}{8}$d. per oz. *Copper.*—Chili bars, G.O.B.'s and G.M.B.'s, cash, £50 to £50 7s. 6d. ; three months, £50 to £50 7s. 6d. English tough, £55 to £55 10s. ; best selected, £57 to £58 ; strong sheets, £65 to £66. *Tin.*—Fine foreign, cash, Straits, £96 to £96 10s. Australian, £96 5s. to £96 15s. Three months Straits, £96 to £96 10s. English ingots, £101.

Lead continues quiet. Spanish soft, £14 2s. 6d. to £14 5s. ex ship. English ordinary brands, £14 2s. 6d. to £14 5s. *Spelter* continues firm. Ordinary brands, £24 to £24 5s.; special, £24 5s. to £24 10s.; English soft, V&S, £25 Swansea. *Quicksilver.*—The importers' price is £9 15s., and that of second hands, £9 7s. 6d., per bottle. *Antimony.*—Star regulus remains at £76 to £77.

A public meeting of Beaconsfield inhabitants was held one afternoon last week, says a Kimberly correspondent, to consider what steps ought to be taken, in view of the closing down of the Dutoitspan and Bultfontein Mines and reduction of labour, consequent upon the amalgamation of mining interests. I wrote very fully on this subject in September last, and pointed out the serious loss which must accrue to the townships of Dutoitspan and Bultfontein if the intention of the De Beers Consolidated Company to close down part of the mines was carried into effect. I said at that time that the result of such a proceeding would be irretrievable disaster to the local trade, which is entirely dependent on the miners. These views were endorsed to the letter at the meeting held last week, and it was decided that a deputation should visit Mr. Currie, of the London and South African Exploration, and see whether he cannot do something to prevent such wholesale loss falling upon Beaconsfield.

It will be remembered that having closed the open workings in Bultfontein Mine, the De Beers Consolidated stated that they intended to proceed to work the mine on the underground system, but in this respect they have been placed in a somewhat awkward position, for it is impossible for them to do so without the permission of the London and South African Exploration Company, inasmuch as they possess only surface rights around the mine for hauling and depositing sites, and have no right to sink shafts or drive under their hauling sites, save with the permission of the L. and S. A. Whether this company, which is certainly suffering loss in the matter of their stand rents, will meet the De Beers Consolidated on this difficulty and allow them ground in which to make shafts and connections with the mine, I am unable to say. Should they not do so, the De Beers people might be able to arrange with the North-East Bultfontein for entrance to the mine through their workings, which are separated from the old mine only by an imaginary line. Failing this, however, it would appear that the Bultfontein is not likely to be of any great use to the De Beers Company, for owing to reef falls, two-thirds of the mine is now so covered as to be almost useless from an open working point of view.

A very large diamond was found this week in the claims of the French Company at Dutoitspan, its weight being 162 carats. Another find which has created quite a sensation, comes from the New Jagersfontein, and is valued at £10,000. This stone has been viewed at the secretary's office by a large number of persons, all eager to obtain information relative to what they now dub the "mine of the future."

TRADE NOTES

A hydraulic apparatus for the abstraction and recovery of valuable metals from earth, sand, clay, slag, the sweepings of jewellers' shops, and other refuse, has just been perfected by Mr. T. Budworth Sharp, of Muntz's Metal Works, Soho, Birmingham. This invention is stated to be not only valuable for coppersmiths, jewellers, and other metal-workers, but most effective for gold-mining purposes; several of these separators are now on their way to the South African gold fields.

Mr. Robert Turner, of 53, Princess Street, Bury, is the patentee and inventor of a new chronograph which is now being manufactured by Messrs. Newsome and Co., of Coventry, for registering the one-sixtieth part of a second. This is claimed to be effected by fixing upon the escape-wheel arbor a second wheel of *forty-eight* teeth, which gears with another wheel, or pinion, of *eight*, which carries a short hand upon its axis round a small auxiliary seconds dial divided into 60ths, the result being that, with the ordinary chronograph train of 18,000, this small hand makes a complete revolution per second. This is what Mr. Turner calls his decimal hand, as there is the ordinary centre-seconds hand on the large dial. The hands are stopped by braking either the wheel of forty-eight or the small wheel. The dials are divided by special appliances to ensure absolute accuracy. The system is applicable to any ordinary centre-seconds movement, although the movements of the watches we saw were made by Messrs. Newsomes, who manufacture all parts of their watches.

One of the largest lines of novelties for the forthcoming season is shown by Messrs. H. J. Cooper & Co., of 150, Oxford Street, W., who are admittedly one of the firms reaping the greatest advantages from advertising in these columns. We had recently the privilege of inspecting the stock in the warehouse and showrooms at the above address, and were very much struck with the large and varied assortment now on view, and suited to all the wants of the jewellery trades. This includes every description of chatelaines, cigar and cigarette, card and vesta cases, sovereign purses, photograph frames, mirrors, napkin rings, buckles, cloak clasps, &c., &c., in gold, silver and metals. All kinds of jewellery suitable for ladies and gentlemen, including chains, studs and rings in great variety; and English and Swiss watches at almost every price. We were also shown a large number of wristlet and bracelet watches, in gold, silver and nickel. What particularly took our fancy on this occasion, however, were the clocks at present stocked by this enterprising firm. Without being invidious, we can safely say that no finer selection of new and fancy patterns in these goods could be found in the city of London.

A few days since we had the pleasure of being shown over a very extensive and complete factory in the jewellery and silversmith line, belonging to Messrs. Robert Pringle & Co., Wilderness Works, 40 and 42, Clerkenwell Road, London, E.C., established over 50 years since. Here we found what we seldom do in the wholesale, all branches of the trade—gold, silver and gem jewellery making; gilding, plating, refining, assaying, electro-plate manufactory, and silver-plate making, carried on under one roof, and in the most orderly and scientific manner possible, with every appliance that science and enterprise can suggest. The warehouse, showrooms and offices, are admirably constructed, and the appliances and workers, from the steam engine in the basement to a brigade of female burnishers in the uppermost floor, all working as one machine under able superintendence. What struck us was, that a trade of so many artistic and scientific branches could be carried on so well under one roof till we found out the key, which was this: The genial and practical proprietor, Mr. Robert Pringle, who showed us over the works, is what is called "well buoyed up," that is, he has a multiplicity of sons; and it was with considerable pride that we were passed from one department to another to be introduced to Messrs. J. & R. Pringle, managers, bullion and refinery department; Mr. W. Pringle, manager, silversmith department; Mr. E. Pringle, manager, watch department. All this, we must admit, gives the firm a great advantage, and tells well for its prospects in the future, and also ensures a capital market for placing foreign indents. What is to the interest of the buyer is evidently to the interest of the many members of the firm, who are the managers, and to the firm as a whole, and in a business of this kind requiring the exercise of so much skill, care, and practical knowledge, it must be an advantage to Colonial buyers and the export trade, to send indents to a house like Robert Pringle and Co.'s, where so much personal superintendence is given to filling the orders. Mr. Robert Pringle and his eldest son made a tour of the Colonies some time since, and resided there a considerable time, they are therefore well acquainted with Colonial requirements. Buyers would do well to send for price lists of this firm, which are most comprehensive and useful.

Midland Jottings.

The boom in trade which has prevailed throughout the Midland manufacturing districts during the past trimester shows no signs of any diminution. After the interruptions due to the Christmas and New Year's celebrations, there is apparently every prospect of trade operations being resumed with renewed vigour in all branches. Both in Birmingham and Coventry manufacturers are in full swing; factories are working up to their utmost capacity, and orders continue to pour in.

In Birmingham, especially, it is almost impossible to obtain goods on approbation, and it is quite amusing sometimes to notice the diffidence with which jewellery on such terms is asked for and the stern *brusquerie* with which it is refused. But manufacturers busy and manufacturers slack are two very different classes of individuals,—in the former case they have to be approached very gingerly, and every care must be taken not to hurt their finer feelings, while in times of trade depression too many of them are only too willing to scatter their goods about broadcast. It is their own fault; everyone cries out against the appro. system while defending it in the same breath as a necessary evil (in bad times), as the outcome of trade competition. Anyhow, there is an end to it for the present, at least, and it is to be hoped that its resumption is a far off possibility. Bolstering up shady retail concerns does not commend itself to the far-seeing business mind, and experience has shown it to be sometimes attended with disastrous results.

Of the goods that have been "going" during recent busy times may be mentioned the different kinds of sleeve links and studs with fancy names and mostly patented. The "Castle" link, of which Mr. T. Walter Jones, Hylton Street, Birmingham, is the patentee and manufacturer, is one of these specialities that has met with an almost phenomenal demand, keeping the factory at the utmost stretch to meet the orders coming in. The uninterrupted popularity of these links is sufficient evidence of their merits, which in the way of simplicity and strength, a reference to the illustrated advertisement on another page will make obvious to the practical dealer in this class of jewellery. We can endorse the other advantages claimed in the advertisement, while an inspection of the immense variety of patterns in which the links are made (which is rendered possible from their construction) fully explains their long continued success. They are well finished in gold, silver, nickel, bone, pearl, and other materials, and new shapes and styles are continually being added.

No abatement is shown in the demand for moonstone jewellery, to which attention was recently called in these columns, and those manufacturers producing it are fully employed filling orders in hand. The beautiful but costless adularia, as it is scientifically named, with its vitreous and pearly lustre, harmonises well with almost any other kind of gems, and it is usually set in bracelets, brooches, &c., in company with rubies, diamonds, emeralds, and pearls. Looking over some of Messrs. Lucas Brothers', Hylton Street, Birmingham, novelties for the New Year, we were particularly attracted by a collection of bracelets very tastefully and artistically mounted, in which the moonstones are mounted in company with diamonds, sapphires, &c., with great effect. Another comparative novelty worthy of mention, and for which a renewed demand seems to have set in, is the scarf pin which can be converted into either stud or safety pin. The latter allows of the scarf being tied in any fashion desired, effecting a saving in the wear of the article of dress, and is also a far neater affair than the old style of pin, although this convertible pin can be used either way. The pins we saw were made plain and in clusters, mounted with diamonds, pearls, sapphires, &c., altogether a very taking line of goods.

No return to the fashion for wearing long earrings is shown in Birmingham, if the London demand is anything to go by, and although reports from Paris would indicate that a revival of the style is rather imminent or has come about, orders from that city are normal. Paris takes considerable quantities of Birmingham jewellery, but it is mostly in specialities, such as pencil cases.

This is the season for such goods as flower holders, serviette suspenders, &c. One of the most sensible contrivances for the former purpose we have seen is the "Gipsy" flower brooch, which is manufactured by the patentee, Mr. James Fenton, of Great Hampton Street, Birmingham. It is formed on the safety pin principle of one solid piece of wire ingeniously twisted, and permits of a "button-hole," of any size required, being instantly affixed or removed. There are no solderings nor complications whatever; it is therefore strong and cheap, and should be especially favoured by those who affect the claw-hammer. The manufacturers report that the demand equals the supply. Mr. F. Venour, jun., of 97, Spencer Street, is manufacturing a line of serviette suspenders in various styles, which, from the price and quality of some we saw, are likely to have a run on them for some time.

Messrs. B. H. Joseph & Co., 20, Frederick Street, Birmingham, says the *Jewish Chronicle*, have just turned out of their factory a very handsome set of mounts for ornamenting the Scrolls of the Law used in Jewish Synagogues. The class of work is unique, and is somewhat of a departure from those in use in most congregations. They consist of two bell-mounts, a breast-plate and a pointer. The bell-mounts are made in silver, and formed in the shape of three canopies, one surmounting the other, with bells hung at intervals on the outer edges. The style is *repoussé*, and the handsome chasing, enriched as it is with gilding in different colours, with a white background, gives a very beautiful effect. The breast-plate consists of a square silver plate with the upper corners rounded, and is chased and gilt to match the bell ornaments. On this plate are fixed the two tablets of the law surmounted with the name of the Deity engraved in Hebrew characters. The pointer, also of silver, is of the usual form, but is surmounted with a crown, and around the centre is a ring and shield on which is engraved the monogram of the donor. The work on this is *en suite* with the other ornaments. These have been made by Messrs. B. H. Joseph & Co. for a client of theirs in South Africa, who will present them to the congregation of which he is a member. The work is such as to reflect great credit on the firm that has produced it.

We have received some interesting illustrated sheets from Mr. A. Sydenham, of 26, Frederick Street, Birmingham. These comprise: illustrated price lists of jewellers' materials; special lines of chains, including hall-marked gentlemen's 18-ct. gold alberts and ladies' bright gold ditto; bright gold and 9-ct. hall-marked brooches, with diamond and pearl centres of very chaste and pleasing designs; name brooches in a great variety of patterns; diamond goods of every description, from the cheapest diamond pin to the most elegant rings, &c. In other branches are silver fruit knives, with pearl and silver handles, and most of the latest novelties in electro-plated goods; silver rings, pins, studs, solitaires, thimbles, &c. On receipt of these catalogues we inspected the goods mentioned, and can say that the whole of the stock we saw, of which the lists give an accurate description, is of exceptional merit, both as regards quality and price. Mr. Sydenham makes a distinct speciality of all kinds of gold and silver and bronze medals, crosses, badges, &c., for athletic and other prizes. The illustrated sheets with price lists of these goods, of which an almost inexhaustible variety are shown, should be at once applied for by every recipient of the present number of the Journal, as the goods are particularly suitable for colonial markets, and the sheets form a standard of reference to dealers.

Messrs. Deakin and Francis, Regent Place, are to be congratulated on the success of their installation of the electric light on their premises. The new departure promises to be a gain in every way; it will certainly effect a great saving in the wear and tear incidental to working by gaslight, absence of heat in the warehouses, and remove a great source of trouble to the firm in avoiding the soiling of the stock. Although the new system has not been long applied, greater efficiency of the employees is already remarked, and the firm think that the light will not prove more expensive in its working than was the gas formerly used. The light is generated through one of F. H. Royce's (of Hulme, Manchester) non-sparkling dynamos, without accumulators, in which the electricity goes straight to the lights (25 in number, and which are Edison's incandescent lamps of 16 and 32 candle power, respectively), and the power is supplied by a Whittaker's (Manchester) gas engine of two-and-a-half horse-power. When we went over the premises, at the firm's invitation the other day, everything was working satisfactorily, and every one expressed themselves as highly satisfied with the new system, which, now that its possibilities and practicability are shown, seems likely to have an important future in the Birmingham jewellery trade. We hear of other firms who are already adopting it, among those who have commenced fitting it up being Messrs. G. H. Johnstone & Co., and Mr. James Fenton, of Great Hampton Street.

A large collection of antique foreign silver, consisting of quaint and curious tankards (with and without covers), flagons boxes, trays, bottle-holders, spoons, &c., has been gathered together by Mr. I. S. Greenberg, of Vyse Street, Birmingham. Some particularly fine specimens of Russian, old Dutch, and Norwegian work are numbered in this collection, ancient tankards in silver and niello work being especially remarkable. A variety of old toys also makes part of a most interesting show.

Owing to the anticipated irregularities of employees and the trouble of making up their wages' accounts, most of the Birmingham firms closed down for the Christmas week, notwithstanding their anxiety to get forward with the work in hand. This was not possible with some firms, who therefore kept going on the Monday and Tuesday preceding Christmas Day. A good many would have liked to get to work during the remainder of the week after Christmas Day, but discretion proved the better part of valour, and very few were to be found who ran the risk. The thought that visions of turkey and other stimulants (by-the-bye, is turkey a stimulant?—dyspeptics are to be found who think not) would rise before the eyes of workpeople, instead of their work, kept the most misanthropic iconoclasts in the groove of time-honoured custom (not a bad custom after all), and they had to assume the virtue "though they had it not." The consequence has been that everyone had his or her usual annual relaxation with its "concomitant evils," and by the time these lines are in press will have shaken off the effects of the latter and be proceeding with the accumulated work "like giants refreshed with wine." We trust the work won't give out before their refreshed energies are again in need of recuperation.

Coventry, like her bigger sister, has had a full share of the trade that has been going. Everywhere factories are seen in full work, and it is a most unusual thing to see any of the lights out before eight o'clock at night. With the increased trade being done workmen are demanding higher rates of pay; the rise in this respect being quite cent. per cent., taking the average all round. Considering the state of trade which prevailed in this centre not so very long ago, the present vitality is quite astonishing. Present prosperity is, of course, due in great measure to improved trade prospects in other manufactures, but great credit is nevertheless due to the way in which the Coventry watchmakers have pulled together for the benefit of the whole trade. London, and Clerkenwell especially, would do well to take a lesson from them. An instance of this is to be seen in the manner in which the movement manufacturing syndicate has been formed by the local manufacturers.

Messrs. Alexander Edwards & Co., Coventry, are again calling attention, in an advertisement in this issue to their "Safest" English Lever Watch. At the time this watch was first placed on the market we had occasion to favourably comment on it, and since then the manufacturers has received many valuable testimonials as to its merits. By structural alterations and attention to details, further improvements have been made in these watches, and colonial buyers to whom quality is the desideratum rather than lowness in price, could not do better than obtain a sample of the "Safest."

The Midland House to House Electricity Company, of Birmingham, have given notice of their intention to apply to the Board of Trade, under the Electric Lighting Acts, for a provisional order authorising them to supply electricity for public and private purposes in Coventry, to construct works, acquire lands, &c. Should the Board see fit to comply with this request, a great revolution will be effected in the lighting of manufactories, and it may be expected that the watchmakers will avail themselves largely of the new light, which, from its cleanliness and other advantages, is particularly adapted to their requirements.

Mr. J. Vickers, of Chapel Street, Coventry, reports that the demand still continues for his speciality in watches having the portraits of sporting celebrities on the dials. Among the latest of these watches he has constructed is one for Samson, the "strong man," of Royal Aquarium notability.

At a meeting of the Coventry City Council last month it was stated that great complaints were made as to the non-lighting of the Market Hall Clock, this being due, it was said, to repeated failures of the automatic machinery employed for lighting it. It will be in the recollection of our readers that when the question of lighting the Westminster clock was on the carpet, Mr. Denison (now Lord Grimthorpe) expressed himself very strongly against any automatic arrangements for effecting it. He said that, as a man was required to be in daily attendance for winding the clock, he might just as well light the gas for illuminating it, and that whatever automatic apparatus for the purpose were constructed, there would always be a liability of its getting out of order and breaking down. As this has happened in the case of the Coventry clock, we recapitulate Lord Grimthorpe's opinion for what it is worth and for the benefit of the Market Hall Committee, to whom the matter is referred.

The Chairman of the Coventry Watch Trade Association having recently received an anonymous letter informing him that certain local manufacturers were making up watches with foreign materials, in contravention of the watch clauses of the Merchandise Marks' Act, the committee of the association are advertising to the writer of the letter that, if he will communicate with the secretary, any information he can give will be taken in strict confidence, presumably with a view to the society taking steps to prosecute the offenders should there be anything in his allegations. Although, as a rule, we don't believe in taking notice of anonymous communications, the present instance is exceptional for obvious reasons, and the prompt action of the society is commendable. It is to be hoped that, by the time these notes are in the press, the writer of the letter will have come forward as requested. He has nothing to fear, as he would be supported by every firm of repute in the trade, and such general accusations do a lot of harm in the mind of the public.

A Fraudulent Bailee.—At the Horsham Petty Sessions last month, George Murray Gregory, watchmaker, was sentenced to six weeks imprisonment for having illegally pawned two watches which had been entrusted to him to repair. Prisoner had a good character given him, which accounts for the lenient sentence.

BIRMINGHAM NEWS

From Our Correspondent.

The year 1889 has gone out with a considerable amount of *éclat*—in fact, in quite jubilant style. As a business year it bears a very greatly improved character to that of its immediate predecessors; it has, indeed, been notable as the commencement of a season of prosperity for the jewellery and kindred trades, the continuation of which is not wanting in very strongly marked signs, and, in anticipation of the same, manufacturers continue to make preparations, in order to be ready to cope with increased demands in all branches of the trade. As the Christmas season approached, early and late hours of working were the order of the day, the Saturday half-holiday being dispensed with in a number of places. This has, of course, put extra money into the pocket of the workman, and thus increased his spending powers, of which he has not been slow to avail himself; and, as this state of things has been continued to the staple trades, as well as fancy ones, there has been a much larger circulation of cash among the Birmingham tradesmen, and light hearts and long purses are the result—the only way to touch some people's hearts is through their pockets.

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There are a few new ventures for 1890 on the tapis. The premises situated in Lodge Road, Birmingham, commonly known as "Barwell's Rolling Mill," which were built about 1871 at a cost of something like £22,000, and which have never been used in any way from the day of their erection until now, have just been secured by Messrs. Kynock and Co., for the rolling of flat sheet metals, and preparations are being hurried on for the commencement of work. The premises are very extensive, have frontage to the canal and railway communications, and are capable of holding some five hundred workpeople. If this is a success, the household property in the district, which is a working neighbourhoood, will find a steadier supply of tenants than has been the case of late years.

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Another bold step is that of Mr. Lyons, pawnbroker and jeweller, of Snow Hill, Birmingham, who is sending out an agent to Central Africa with a stock of diamond and other goods, estimated at about £20,000. One cannot help congratulating Mr. Lyons upon his enterprising spirit, and wondering if he has been stimulated by Mr. Stanley's letter of his latest discoveries: next to the explorer, the merchant always leads the way, and I am pleased to be able to report that a Birmingham man thus steps out, and one that belongs to our own trade, too.

* * *

Next comes a considerable amount of gossip to the effect that an American clockmaker contemplates planting himself here in the suburb of Aston, building a large factory for the manufacture of drum clocks on the American plan, employing a large number of girls—report says about 2,000—and thus starting a little community of his own, and do his best to "boss the Birmingham clock trade." The fact that a large piece of land in the Albert Road, Aston, which has been lying idle for years, has just been taken in one piece to build something (nobody seems to know exactly what) is sufficient evidence in some persons' minds that the news is correct, and that in about twenty-four hours a huge factory, all lit with the electric light and fitted up with patent machinery, will be seen by the astonished beholder. "Those Americans know how to do it, you know."

* * *

There is a considerable improvement in the watch and clock trades of Birmingham and vicinity. One firm of watchmakers have just booked an order for over three thousand of their watches at a slightly improved price; they have also been able to give their employees an improved scale of wages, and, altogether, things are looking very rosy with them. This is, no doubt, owing to a great extent to the superior class of work that they are producing at a moderate price.

* * *

Messrs. C. Payton and Sons, Vyse Street, report a considerable increase of business in all their branches, which are somewhat numerous and elaborate, and, with very few exceptions, the whole of the trade report the same.

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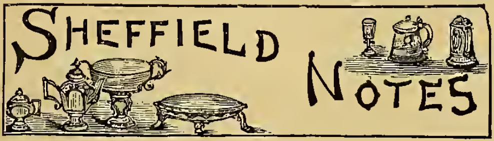
Mr. Edwarn Vaughton, jeweller, Warstone Lane, is removing from that address, which he has occupied for many years, and takes up his diggings in vastly superior and larger premises in Vyse Street. The premises have been occupied until now by a branch of the Conservative Club; Mr. Vaughton has had them remodelled to suit his requirements, and a very handsome and roomy manufactory and warehouse is the result. I wish him every success, and congratulate his sons upon the new incentive to business that they must receive thereby.

* * *

Another outgrowth of good trade is the venture of Mr. Pettifer, late manager to Mr. A. J. Smith, Frederick Street. He has taken the premises No. 9, Pitsford Street, and, although at present the venture is, so to speak, in embryo, yet I have no doubt that by the end of January he will have got the place into working order, and buyers will hear of some good lines to be had from him: his well-known class of work will, no doubt, be as popular as when it came from the warehouse of another.



SHEFFIELD NOTES

From Our Correspondent.

Another instance of the hereditary character which our large electro-plate concerns are acquiring, was presented in the coming-of-age festivities of Mr. A. E. Bingham, only son of Mr. J. E. Bingham, senior partner in the firm of Messrs. Walker and Hall, Howard Street. The workpeople to the number of about 700, with their wives and sweethearts, were entertained to dinner in the Artillery Drill Hall, which was effectively decorated with flags, banners, and plants. The young hero of the evening is not, of course, as yet, known in public life, but his father, as a past Master Cutler, a Justice of the Peace, and Colonel of one of our volunteer regiments, occupies a somewhat prominent position in the town. Colonel J. E. Bingham is a nephew of one of the founders of the firm, so that a continuity of management has prevailed in the concern since the first half of the century. It is claimed that Mr. Walker, the original founder, was the man who first introduced the science of electro-plating into Sheffield. Be that as it may, the firm itself has developed into one of the show-places of the town. All distinguished strangers visiting Sheffield, from the Prince of Wales downwards, make a point of visiting Walker and Hall's, which is now one of the largest electro-plate manufactories in the country. If the young fellow who has just made his entrance into public life has anything like the energy and ability of his father, there is no reason why the concern should not expand to greater dimensions still.

Little more than a week after the above paragraph was penned, people hurrying home from business were startled by the shrill cry of the newsboy, "Shocking accident to Colonel Bingham—this day." Mr. Bingham was driving down to business in the afternoon, himself handling the ribbons as was his custom, with his coachman beside him ready to take the trap home on depositing his master at the works in Howard Street. The horse—a splendid grey—suddenly slipped on the greasy street and fell on its side, but immediately recovered itself without assistance. Mr. Bingham and the coachman, however, were both pitched into the street by the suddenness of the accident, the former falling with great violence, and sustaining serious injury to his head. He was carried to the West Street Hospital, close at hand, in a state of insensibility, but struggling violently. The very worst was at first feared, but in about 24 hours the patient began to recover consciousness, and, although at the time of writing this, not able to be moved from the hospital, and, of course, not yet absolutely out of danger, there is yet every reason to hope that he will pull through. Much sympathy has been evoked by the unfortunate occurrence, and enquiries by telephone were incessant from all parts of the town. The coachman after getting his injuries attended to at the hospital, was able to drive the horse and trap home.

MUCH less fortunate has been the termination to an accident to Mr. James Gallimore, of the firm of Gallimore and Sons, another well-known house in the silver trade. Mr. Gallimore was mounting to the top of the Heeley omnibus while it was in motion, when losing his balance he fell heavily on his head, sustaining such injury that death ensued shortly afterwards.

IT is somewhat curious to note that the two branches of the Sheffield trade most obviously prosperous are almost the only trades which show a falling off in the exports, according to the Board of Trade returns for the past month. There can be no doubt about it that both cutlers and silversmiths were never better off than they are at present, and yet the quantity of both cutlery and plated ware being sent out of the country shows a considerable falling off. Even our own colonies, with the single exception of South Africa, are taking less. This is strong testimony to the general prosperity of the country, for as the goods we are certainly turning out are not going abroad they must be selling at home.

THIS fact makes us the more deeply interested in the question as to how long this state of undoubted prosperity is going to last. The wages of colliers have now gone up nearly 50 per cent. within the last few months, and workmen in other lines of business are doing their level best to get a share of the good things that are going. Small blame to them. The labourer is worthy of his hire no doubt, and the average working man is incapable of looking very far ahead. Nevertheless, upon the the wisdom or un-wisdom of his action depends not a little of the permanence or otherwise of the present state of things.

OUR stock of ivory is being used up at an alarming rate. The large amount of stuff changing hands at the periodical sales in this country as compared with the small quantity imported, plainly enough shows this. No trade combination is responsible for this state of things. The law of supply and demand does it all. In the nature of things the stiffening of the price of ivory is a process which must go on. Sauntering through a silversmith's warehouse the other day my guide pulled out drawer after drawer filled with the now precious stuff. A few years ago the whole lot was bought for less than half the price it now fetches in the market.

THE infraction of a Trade Mark calls forth the same sort of feeling in Sheffield as horse-stealing does in the far west. We cannot certainly lynch the culprit, and even the legal process by which we do get at him is a long and costly one. At the time of writing this, the case of Baker *v.* Rawsen has reached its thirteenth day with very little indication of an early termination. It has occurred to several people here that a more summary process might be devised if a committee of the Cutlers' Company were empowered to adjudicate upon such cases on the spot. The Cutlers' Company, which grants the marks in the first instance, is more likely to come to a speedy and correct conclusion than an untechnical court sitting in London. It is understood that a bill on these lines will be promoted in the next session of Parliament, and it is probable that it will be backed by the whole of the Sheffield members.

THE Chamber of Commerce have decided to urge upon the Government the advisability of negotiating with the different Colonies in order to induce them to adopt the principle of our recent legislation respecting False Marking. That legislation has been found to be so beneficial to the trade of the town that the recognition of the same principles throughout the empire may be expected to work wonders.

The Diamond-Cutting Industry of Amsterdam.

GREAT fortunes can be and have been made in diamonds, but it will not surprise a good many of our readers to learn that the "boom" so much talked about in London amongst the diamond-producers of the world, by which they mean to enrich themselves in a very short time, is ruining thousands of good workmen. It is sufficiently well known that the art of polishing and cutting diamonds, discovered in the middle of the fifteenth century by a citizen of Bruges, when that ancient and powerful community was on the very pinnacle of its wealth and influence, first centred at Antwerp, where it remained in the hands of Portuguese Jews, and was afterwards transferred by them to Amsterdam. Here it flourished for a long time and diamonds were supposed to be polished and cut exclusively in the Dutch capital by people who possessed the secret and kept it for themselves. Even quiet recently, when Amsterdam had lost her monopoly, and when stones could be "treated" as skilfully in Paris and London, the northern Venice remained the most important centre of the trade, where 20,000 to 30,000 carats of rough diamonds passed weekly into the hands of the manufacturers, all Hebrews, working in the dingy quarter where glorious Rembrandt lived and shone forth. In those days diamond-cutting was very profitable. The cutters and polishers had a good time of it. They earned very high wages, and only worked long enough to secure carriage drives and unlimited champagne for the following week. Alas! how are the mighty fallen! These self-same people are now idle and starving through the diamond "boom!" It is a very curious illustration of diamonds cutting diamonds. It appears that very little cutting and polishing is going on at the present time. The manufacturers find it more profitable to gamble in the rough stones, and consequently several factories are idle or working a limited time only. It is supposed that between 5,000 and 6,000 diamond workers cannot now make a living in Amsterdam, owing to the dearness of rough stones and the disinclination of the manufacturers to work them. The cutters and polishers have started a trade union, with a small newspaper to advocate their views, and a mass meeting was held a few days ago at Amsterdam to devise means to end the present crisis. Over a thousand workmen interested in this curious trade were present, and a scheme was laid before them to start a co-operative steam diamond-cutting and polishing factory in the Dutch capital, with at least 500 "discs" or "mills," to be worked for their account. This is, no doubt, the proper way to meet the combination of manufacturers, but the chief difficulty appears to be the finding of the necessary capital. At least, 500,000 guilders, or say £40,000, are required, and the cutters and polishers cannot succeed in collecting this money without the aid of more wealthy fellow citizens. Few seem disposed to assist these people, although the amount required for the new factory is really a trifle for a rich city like Amsterdam. In their despair the starving cutters and polishers of a "booming" article have opened negotiations with the Rothschilds in London; and it is just possible that hundreds of Jewish artisans of Holland will soon migrate to this metropolis should the magnates of St Swithin's Lane entertain their proposals.

The Jewellery Trade in 1889.

As endorsing our views generally on the state of the jewellery trade today, we take the following from the *Birmingham Gazette* :—Since the first of these annual articles was written there has been such a general tendency to describe the jewellery trade as "bad," that it is a genuine relief to be able to offer at the end of 1889 a more encouraging report. Not that the business has fulfilled in all essential respects the hopes of those practically engaged in it. There have been fluctuations, losses, disasters, but in the main there has been progress, and the year ends with a more hopeful tone than has been the case for at least a decade. It must be remembered, too, that this result has been obtained amid many disadvantages. The great Exhibition at Paris, certainly the grandest display of its kind which the world has yet seen, not only took many thousands of Britishers to the gay French capital, but led the wealthy classes to spend their money in heavy purchases during their visit. The most remarkable *tour de force* of Bapst and Falize, an Assyrian style crystal vase, with carbuncle set borders, an enamelled figured lining, and specimens of every branch of the enamellers' art, arranged artistically amid the carved decoration, has been purchased at an enormous price to grace an English home. So also has the finest damascened work of the Court jeweller of Spain ; and these are only typical instances of the way in which the Englishman abroad indulges in lavish expenditure on pieces he would not think of buying in his own country. We may easily, therefore, understand that much money has been spent abroad in special examples of the goldsmiths' and jewellers' art, which might otherwise have found its way into the pockets of the artistic section of British manufacturers in those departments. But there has been a compensating advantage. It is undeniable that the enterprising English jewellers who exhibited at Paris reaped a golden harvest. This was sufficiently evidenced when one hot July afternoon, M. Berger, the able Director-in-chief of the Paris Exhibition, presented himself before the Jury of Awards for Class 37, which was empowered to adjudicate upon all jewellery and goldsmiths' work, and submitted a petition handed to him by the Minister of the Interior. This petition set forth that it emanated from the retail jewellers of Paris, who provided employment to so many manufacturers, in whose establishments were engaged so many workmen, who, with their families, depending for subsistence on this branch of industry, numbered *(environ)* some 20,000 souls. The petition pointed out that the permission to sell accorded to foreigners in the exhibition was occasioning them grievous loss, as such exhibitors were not liable to rent or taxes, and they prayed that it might be stopped. M. Martial Bernard, president of the jury, which was of an International character, rose to the occasion. He trusted that the Minister of the Interior would not even deign to reply to such a petition, which was unworthy of a great industry or a great nation. As the Exhibition was so remarkable a success, and they had such tens of thousands of visitors from all parts of the world, it would be most ungracious, most unbecoming to interfere with the conditions upon which the Exhibition was opened. M. Berger, after an inspection of the jewellery selected for the Exhibition lottery, folded up the petition, and took it away with him without another word.

Having thus shown that British jewellery has fluttered even the dovecotes of Paris, let us note that Birmingham can rival the claim of the petitioning jewellers of the French capital in giving employment to 20,000 persons directly or indirectly engaged in this trade. The Paris shopkeepers, in point of fact, added wives and families to the list, so that it is fair to assume, in the absence of absolute statistics, that the Birmingham employés, strictly such, are more numerous than those in Paris. This is the more remarkable when we reflect that Hutton, the historian of Birmingham, writing a century ago, described all trades then carried on, but did not even hint at the manufacture of jewellery. A trade which, so far as can be ascertained, begun with the present century, then almost died out again, and did not assume any real importance until 1830, has evidently since that time gone forward by leaps and bounds to be able to compare itself with the jewellery trade of Paris in the number of its employés. With all the ebb and flow of the tide of good and bad trade, there has clearly been a general advance ; and the course of the past gives courage for the future, especially now that the general business of the country seems to have taken a real turn for the best. We can readily understand, therefore, that the Birmingham Jewellers' Association, founded a little over two years since, upon broad and sound lines, has become an important and responsible body, and is going steadily on with the work of welding together the various branches of the trade into a compact organization. This was evinced at the first dinner, held in January, when 130 gentlemen sat down, and the Right Hon. Joseph Chamberlain, M.P., who represents the jewellers' division of the city, proposed the success of the association in a well-considered and suggestive speech. The society recognised from the first the necessity for developing a system of art instruction for the employés, which should enable them to meet the demands of true taste in their productions. Their efforts in this direction had been successful, for during the early part of the year gratuitous instruction had been given to 100 pupils, and in the present session this number had been increased to 160. But the need for something more than a drawing school was realized. A desire for technical instruction was strong in the chairman and his committee. Mr. J. W. Tonks and Mr. J. M. Banks had been at Paris reviewing the work and the success of the jewellers' schools there ; the former noting also, with great interest the modes and exhibits of the School of the Industrial Arts at Geneva. Moreover, by a happy coincidence, the Technical Education Act, which was clung to faithfully by the Minister in charge, escaped the autumnal "massacre of the innocents," and safely passed both Houses of Parliament. The City Council of Birmingham, moved by the committee of the Municipal School of Art, and also by Mr. Charles Green, Chairman of the Jewellers' Association, was quite prepared to consider a proposal to put the Act in force. A favourable opportunity soon presented itself, a large manufactory in Vittoria Street having rooms specially adapted for the purpose was available on reasonable terms, and the City Council, at its first meeting in November last, unanimously decided to purchase and fit it up as an art school, devoted expressly to the general and technical instruction of the young people and artizans qualifying as goldsmiths and jewellers. The step is an important one. It is the first in England devoted to a trade which, in its highest development becomes a fine art ; and it will give the Birmingham jeweller of the next decade a fair chance of competing with the French centre of fashion in style, taste, and invention, as well as in the number and variety of his productions.

While in this connection, it is fit to state that Mr. J. W. Tonks, of the firm of Messrs. T. and J. Bragg, of Birmingham, was appointed British juror at the Paris Exhibition of this year, on the International Jury of Awards for class 37 (jewellery and goldsmiths' work). Nor should it be omitted, as a local matter of some solid importance, that Mr. H. Allen, secretary of the Working Jewellers' Benevolent Association, has been elected a member of the City Council.

After thus much relating to the public position of the trade, it may be conceded that it is not "barren honour" with which a report is chiefly concerned, but those more tangible results which spring from practical success. Of this there has been a moderate share in 1889. The year opened badly for the class of jewellers who make cheap articles for the greater number of buyers. The buyers were by no means so numerous as could be wished, and some makers of cheap goods had a decidedly bad time of it. Still there was a quiet, sustained demand for better-class articles, which seemed to indicate that the means of the well-to-do classes were more available or abundant. Dainty articles of tasteful design and high finish, set with diamonds and various coloured gems, were chiefly in vogue. The Siam ruby—a real stone, a sort of cousin-german of the ruby strictly such, and having rich fiery lustre, though different in colour from the true ruby—was cheap and plentiful, so that many charming effects were obtained at comparatively moderate cost. The pearl still held its own, and advanced in price; while the moonstone emerged from the cloud of obscurity in which it had been so long enveloped, and came into sudden favour. Its mild, lambent lustre, eminently suggestive of moonlight, gave it a charm, which was enhanced when it was carved into the visage of the crescent or full moon, the head of a Cupid or a Venus, and circled with stars in diamonds. The remarkable display of taste and fancy at the Paris Exhibition, although not decisive as to the future prevalence of any leading style, yet indicated distinct leanings. One was to the free decoration and loose construction of the Louis XVI. period, the other to the pseudo-classicism of the Empire, which though false in some essential principles, yet had in it many elements of grace and beauty. The influence was soon felt, as must needs be, with antique fashions, Directoire and Empire costumes; and many charming reproductions involving combinations of pearls, diamonds, and other gems with masses of enamel, appeared and found favour in æsthetic circles. The liking for the quaint and olden is evidently extending, and it is especially evidenced in the silver personal ornaments, chatelaines, and appendages, as well as in the ordinary walks of brooch or bracelet; while toilet and table ornaments of small size in silver have found an enormous sale.

Colonial and shipping business has been more generally satisfactory than in former years, while by the approach of autumn it was gradually discovered that a good season for home business was setting in. The setter of stones began to find himself a person of more than usual consequence. Members of this branch of trade had quitted it in former bad years, and a strong winter demand was sufficient to tax the energies of those who were willing and high-class workers to the utmost. The question is always asked, what will happen after Christmas?

The sudden cease of demand, at the beginning of the New Year or at latest about March, has been so marked in recent years that manufacturers are beginning to wonder whether they may not have to adopt a plan similar to that in vogue at Paris. There a master jeweller often doubles the number of his employés about September or October, and as trade falls towards spring dismisses those he does not need, leaving them to their own devices and keeping just so many as are requisite te carry on his trade for the summer. This is easier in Paris, where an amount of skilled and artistic labour is always available. But it has its bad side, as it leaves a number of people to find chance employment how they can; and such workmen are naturally very combustible materials for the agitator and Socialists to work upon, unless they can let apartments for the summer, which is what most of them try to do. Birmingham offers no such inducements as the French capital, and it is here the custom of all the best employers to retain their people throughout the year; resorting to short time on occasion to bridge over the difficulty of bad trade. Fortunately the past year has seen much less of this than usual; and the amount of overtime worked during the past three months must be largely in excess of the average.

If the jewellery trade cannot like most other trades boast of a "strike" during the past year, it has had the privilege of a "corner." It happens to be diamonds in this instance. The large proprietors have combined and bought up all the smaller mines; and now, having all the main sources of supply in their hands, have begun to restrict the output. The idea is that as diamonds are only three-fourths the price per carat, speaking generally, that they were twelve years ago, they may, by judicious arrangement, be raised to that figure. This is a pleasant prospect for the ultimate purchasers, but unless new mines are discovered it is very likely to be realized. The best chance, therefore, for the public who wish to invest in diamonds is to buy at once.

Having now gone over the salient features of the jewellery trade for the present year, we must record it as one of improvement. For the first time in many such this progress gives a fair promise of continuance. Supposing the improvement in the staple trades of the country is not discounted or prevented by suicidal contests between employers and employed, the jewellery trade is certain to have its full share in general prosperity. In art matters manufacturers and workmen are awakening to the requirements of their calling; and while the commercial success of the trade is assured by good management and sound finance, it is probable that more systematic efforts in art education may help to give nobility and grace to a British industry which has already established itself on so wide and practical a basis.

Design considered as a "Commercial Value."

IN reference to the proposed new School for actual Art and Technical Training for Jewellers, as treated of at the general meeting of the Birmingham Jewellers' Association (a report of which will be found on another page), a few words on the value of design, simply in its business as distinct from its artistic aspect, may not be out of place.

For, after all, to us with whom jewellery is a livelihood first and an "artistic expression" a long way afterwards, what will sell is of far more importance than what will be a "thing of beauty," and the primary consideration in respect to art culture is whether it will increase or diminish our trade. The jewellery trade does not exist for the special purpose of cultivating the taste of the British public, nor for creating a natural style of art which shall outlive the centuries (whatever that may mean). If these things can be effected without interfering with our business so far so good. If by paying attention to these things we can increase our business so much the better. But to us as *business men* (as distinct from *artists*) a mere sentimental babbling of "true principles of design" and "applied art" is of no use and of no value. The touchstone of £ s. d. is the only test we are prepared to admit, and our yearly balance-sheet is our only criterion of success or failure.

What lessons in this direction do we gain from our past experience? Have we not repeatedly found that our best selling patterns have been those on which least care had been spent, and which embodied no idea whatever; while how often has it been the case, after special attention and a conscientious endeavour on the part of both designer and workman to reproduce some artistic conception, such pattern has proved a failure? Again, does not a great portion of our trade consist of a succession of "runs" upon various new "fads" of fashion. Now it may be coils and horse-shoes, anon it is bars and discs; now turquoises may be all the go, while a little later moonstones are the rage—and, for the time being, *anything*, artistic or not, will sell that catches the prevailing fancy. Further, the constant cry for cheapness and the consequent increase in the use of die work, irresistibly tends to the commonplace and the ugly; and where "art" spells "expense" what chance has it in the present condition of the market? To such an extent has the foregoing reasoning prevailed, and so potent has been its influence, that the majority of makers amongst us have settled down to a habit of perfect indifference on all matters pertaining to design, and are content to go on, year after year, turning out work by the rule of thumb, and filling the market with articles that are essentially "without form."

But long use does not necessarily prove a habit to be good, nor does a string of sophistries guarantee a right conclusion. Possibly in that one word, "cheapness," we have a key-note to the whole matter, and it will perhaps repay us to re-learn our lessons—to go again through our logic. And so, if those patterns previously referred to, on which we prided ourselves, but which did not sell, we would ask ourselves were they really artistic and did they express the art ideas current at the time. Art out of fashion is as bad as ugliness out of fashion, as far as selling is concerned; and of our typical goods which sold so well, should we not have had better orders and longer runs had our patterns been pretty and tasteful instead of the reverse. Surely a coil or a horse-shoe may as well be artistically rendered as otherwise, and a stone will show to at least equal advantage in a properly designed mounting as in an uncouth and unmeaning one.

Speaking generally, there are two great divisions into which our trade naturally falls. In the first we would place the great bulk of jewellery, in the second such special work as corporate insignia, presentation caskets and keys, and prize cups and vases, and in reviewing the history of this second division we may find something to illustrate our present subject. Years ago—we are not now referring to the genuine examples of mediæval goldsmiths' work, which of course have a special interest of their own, but to a more recent past—years ago such special work as was turned out had little to recommend it beyond mere bulk of metal. Uncouth of form, and aiming neither at historical connection nor local interest, its actual value was so much per ounce. Later, however, a revival set in. Each article received special attention, each design was carefully worked out in accordance with a definite idea of the use and intention of the piece. Local circumstances or the occasion of presentation were embodied, and something beyond a mere chain of gold or a silver box was produced. In short, such pieces of work to-day are the results of the ideas of clever and specially trained designers, carried out by equally clever and specially trained workmen.

And what, commercially speaking, has been the result of this art development in this direction? Simply that an immense and constantly increasing demand for such work has been created. Year after year has greater care and deeper learning been bestowed on this portion of the jewellery trade, and year after year has it continued to grow in importance. Thus we see that in this special work design has a decided "commercial value," and our test of £ s. d. pronounces it to be of hall-marking quality.

And undoubtedly the same good results would follow the introduction of art principles and art workmanship into the great bulk of our trade. There is no reason whatever why ugly and idiotic patterns should sell in preference to neat and tasty ones, *provided the supply of such is forthcoming*, but if the former sort so greatly predominate of simple necessity their sale must be the more extensive as long as people buy at all.

Now let us again look back for, say, a couple of years, and do we not find that during this time we have been turning out a series of new and pretty patterns which have readily sold and been re-ordered, while many of our old goods which were in stock then are in stock now. According to our own hackneyed explanations, this was because "things are so quiet that people will only be tempted by new goods, and will not look at the regular stock at all;" but is it not a simple fact that we have thus created a certain amount of business by extra attention to the production of suitable patterns. Here, again, the "commercial value" of design is forced more closely home to us, and it will be well for us to give heed to the lesson. Properly worked up, this almost undefinable quality of design will well repay cultivation, and will be like new capital put into our businesses. When once the matter is resolutely grasped, it is no more difficult and no more expensive to turn out good work than bad; and cheapness within fair limits is not incompatible with artistic design, workmanship, and finish. We said just now that die work tends to the commonplace and ugly, and, unfortunately, it is too true; but the reason is not that die work is necessarily inartistic (as witness the large quantities of exquisite work continually produced), but because of the limited knowledge and indifferent training of the majority of our die-sinkers. So with our pattern-makers, our mounters, our setters, and our engravers—it is the limited knowledge and indifferent training of the great majority of these our workpeople that is responsible for the vast amount of rubbish turned out of our shops, and which has undoubtedly tended to hinder, rather than help forward, the revival in the jewellery trade.

Upon careful consideration, we are forced to the conclusion that there is a distinct business value in appropriate design, quite apart from any æsthetic considerations—a value which will be felt and appreciated pecuniarily by both masters and workmen. It will be a good thing for the trade at large when the proposed schools are fully occupied disseminating art principles and art practice among our managers and our workers, for then this "commercial value" of which we are writing will be no longer a theory, but a fact, and we shall find that our efforts to supply the world's artistic needs will be reciprocated by an ever-increasing demand for our productions.

It is totally beyond the scope of this article to consider how this desirable end shall be best accomplished, or to give suggestions for its effectual carrying out. These matters will doubtless receive full and thoughtful consideration by those actively engaged in the scheme. Suffice it for the present if we have done some little to help it on, by convincing the indifferent and the thoughtless that it is to their individual interests to give it their support to the utmost possible extent.

The Hatton Garden Robbery.

A DARING robbery of a postman's letter-bag, containing valuables—to what amount cannot yet be ascertained with any degree of accuracy—took place on the 17th ultimo in Hatton Garden, where a large number of firms dealing in diamonds, precious stones, and jewellery are located. At about a quarter-past eight a postman named Smalley, who had previously made a few deliveries, went to No. 10 to give a registered letter to Mr. Crosbie, on the second floor. The door had been unlocked, and while the postman was waiting for the receipt to be signed he was seized from behind by two men, who struck him down, rendering him insensible, and made off with the letter-bag and its contents. When Smalley recovered consciousness he found himself in the room with the door locked and his bag gone. He then took up a chair and proceeded to break the glass of the door to effect his escape and raise an alarm. When he got downstairs he was seen to be suffering from shock, and was taken in a cab to the hospital, where it was found he was suffering from injury to the neck, and shock consequent on the sudden character of the attack. He, however, did not remain in the hospital long, but returned to Hatton Garden, where in the meantime the police of the King's Cross Road Police Station had arrived, and to whom he tendered all the information as his disposal. Upon an examination of the room being made it was found to contain only the following articles of furniture: One table, two chairs, and oilcloth on the floor; while on the wall by the side of the street door next to a chemist's, was the following notice, written in ink on a square piece of paper: "J. D. Crosbie, jeweller, second floor." The stairs are very narrow, and as the place was in semi-darkness at the time it is supposed that prior to the arrival of Smalley the men obtained admittance by the front door, which was partly open, and secreted themselves on the first floor to await the arrival of the postman. When the news of the robbery became known, a large number of diamond merchants congregated in the vicinity of the Post Office in Hatton Garden, and all sorts of rumours were afloat as to the theft and value of the stolen bag. One story was to the effect that it was the Cape mail-bag, containing valuables to a very considerable amount of money, but these letters were delivered late on Monday night. There is no doubt, however, that the thieves were under the impression that they were about to secure this mail-bag, but in this they were disappointed, the bag captured containing the ordinary morning delivery, and at the same time valuables estimated by some merchants in Hatton Garden at between £7,000 and £8,000. One firm were expecting a diamond necklace, the value of which cannot yet be ascertained; another pearls to the value of £500; and it is stated that in one registered letter there were cheques to the value of about £400, but as these were crossed immediate steps were taken to ensure stoppage of payment. In answer to enquiries at the General Post Office, it was stated that the authorities were unable to give any information as to the value of the contents of the stolen letter-bag, but hope to be able to furnish some idea shortly when they have received replies from their telegraphic communications on the subject. Smalley has been delivering letters in Hatton Garden for some years, and every person by whom he is known bears testimony to his straightforward and honest character. He appeared to be in a very distressed condition at the loss of his letter-bag and its contents, but is receiving sympathy from all quarters. It appears that about two months Crosbie took the front room on the first floor at No. 10, and paid a quarter's rent in advance. He has been in the habit of receiving letters from abroad, and, it is stated, was in the room on the morning of the robbery, but he has not been seen since. The police, who have no clue as to the assailants, have issued the following description: "Aged 45 years; 5-ft. 7-in. in height; complexion and moustache fair. Wore a pepper and salt jacket, light vest, light hard felt hat. Respectable appearance." The bag is stated to have contained about forty registered letters, most of which came from France, besides ordinary correspondence.

The Coventry Watch Movement Company.

THE history of the systematic manufacture of watch movements in Coventry, says the *Coventry Herald*, is very short. Towards the close of last year the Prescot makers conceived the idea of protecting their trade and securing a monopoly. To this end a syndicate was formed which bought up most of the watch movement manufacturing businesses in the country. Had this project been allowed to go unchallenged, the result, by increasing the price of movements, would have been disastrous to the Coventry watch trade. The Coventry manufacturers, however, hitherto dependent upon Prescot, awoke to the fact that it was an altogether unnecessary anomaly that watch movements should have to be procured from Prescot when they might just as easily be made at home. They accordingly responded to the Prescot move by forming a company to manufacture their own movements. The business of a Prescot movement manufacturer—Mr. E. Scarisbrick—was purchased, and premises were taken in Hill Cross. Mr. Charles Scarisbrick was secured as manager, and the manufacture of movements on a limited scale was commenced. The establishment is now in working order. A visit to the workshop—the place is too unpretentious to be called a factory—shows that most of the workmen are from Lancashire, Mr. Scarisbrick, upon the recent changes in the Prescot trade, having made a good selection from the men employed there. The manager first of all points to some large sheets of watch metal—the raw material—and explains that after having passed through the hands of the various people in the shop, it comes back to him in the form of finished movements. To illustrate, he picks out with pincers, from a small pill-box, the delicately-fashioned, disconnected parts of a watch, so fragile that they might apparently be almost blown away in a breath. The visitor is then shown round the workshop, and the successive processes through which the metal passes before it is ready to form part of the wonderful mechanism of a watch, are explained. The only operation thoroughly intelligible to the uninitiated is the first—a simple one—by which discs of metal are stamped from the raw material. For the rest, one can only wonder at the marvellous intricacies with which each process is fraught, and admire the skill of the men and girls who perform the work. The marvellousness of the industry is not lessened by the intimation that there are sixteen branches in the trade, all carried on beneath this small roof, and that at least a thousand processes are necessary to complete a single movement. All the parts are made interchangeable, so that wheels or other parts of a watch that have been injured can be renewed from stock, without having them specially prepared. The system adopted is the original English method, with no foreign innovations. The plant and machinery is as good as can be obtained, some of the machines being unique. Both fusee and going-barrel movements are manufactured, and some keyless work is done, although this branch of the trade has not yet been thoroughly developed. A fair amount of trade is done, the popularity of the Coventry movements being principally due to the fact that owing to careful superintendence, the wheels and pinions are perfectly true.

The Hill Cross premises are only occupied temporarily, until the new factory in Spon Street is ready for the reception of the plant, machinery, and employees. There will be accommodation in the new building for 130 workpeople. The factory itself, exclusive of offices, will be 120 feet by 28 feet 3 inches. One of the offices is 20 feet by 14 feet, and the other 14 feet by 12 feet, and are so arranged that, should the necessity arise, they can be converted into workshops. There is a store-room 10 feet by 8 feet, and an engine-house at the rear for a six-horse power gas engine to supply the motive power for turning the lathes. The factory is divided into six bays, the top being lighted with north lights. Two projecting bays of 6ft. 6in. each have been made on the west side, in order to get a front light for particular departments. In the centre is a foreman's raised cabin, and the floor space of the factory will be equally divided between the male and female employees, separate entrances, cloak rooms, and lavatories being provided. The architect is Mr. H. W. Chattaway, and the builder Mr. C. Garlick. The artificial lighting arrangements are in the hands of the Coventry Gas Fittings Company, and the heating apparatus is being fitted by the Eagle Iron and Engineering Company, Coventry.

The Localisation of Manufacturing Industries.

Black Forest Clocks.—Watchmaking in "La Vallée."—Industrial Villages.

HAVING before him the Report of the British Consul on the Clock Trade of Mannheim, of which we gave an abstract in our last issue, a correspondent of a contemporary evolves the following interesting article on the subjects indicated by the above headings:—

For ages the Mannheimers have been given over to the making of homely timepieces. Everyone knows the appearance of the old-fashioned "Schlaguhr" produced by them—a heavy article in a large wooden case. Year after year the same pattern was turned out, until it seemed as if the fashion would never change. And it is quite possible that Mannheim would have continued to manufacture this mediæval machine for all time, had not Connecticut entered into rivalry with it, and induced the customers of Germany to buy the more compact American model. A little longer, and the trade would have departed from Mannheim. The manufacturers, however, saw in time the way the tide of popular taste was running, and soon began to change their style, succeeding so well, that they can now turn out clocks cheaper than those of the foreigner, and, in their own way, quite as good. But their prosperity is again imperilled by the eagerness of rivalry. Not content with making American clocks cheaper than can the Americans themselves, some of the German manufacturers, in their keenness to undersell their neighbours, are producing an article so bad, that the output of the Mannheim factories is falling into general disrepute. As our Consul points out, with an improvement in quality, better prices, and better profits could be obtained, the agents and retail dealers being at present the chief gainers by this suicidal competition. Indeed, for a time it seemed, in German clockmaking as in many other trades, that excellence was on the eve of being sacrificed to mere monetary cheapness, so that, after a few years of price-cutting, a good clock would be impossible to obtain. Happily, the best makers find protection and encouragement in the conservatism of the English customer. This country is now almost the only market for the best quality of timepieces. And in order to effect a sale of them, they must be made in a particular style, with certain conventional ornaments and niceties, which, as they require long practice to execute, only the oldest firms find it profitable to produce. In fact, the new men are forced to confine their attention to the "cheap and nasty" descriptions, while the more experienced ones are still able, thanks to our national preference for a good article at a fair price, to continue manufacturing clocks which keep up the well-earned repute of the Mannheim "Uhrmacher."

An instance of the curious persistency with which certain trades cling to particular localities is the way one or more of the Swiss valleys, in spite of the rivalry of the great factories, and of labour saving machinery, continue to be the home of watchmaking and its collateral arts. Take, for instance, the slopes of Mont Tendre and the shores of Lac de Joux. Here are made some of the finest watches in the world, chronographs, repeaters, chronometers with three and four dials giving the hour at as many different places, and—if you do not forget to wind them up—capable of acting as a perpetual calendar. Some of these horological marvels, after being cased and regulated at Geneva and Berne, are saleable at prices ranging from £40 to £200. There is, of course, no reason why they should not be made elsewhere, since there is nothing in the climate or in the raw materials of these Swiss valleys and mountain slopes that enforces the localisation of the art. Yet, as a matter of fact, it is only in this lofty Alpine valley—La Vallée *par excellence*—that the inherited skill and aptitude, coupled with study and patience, essential to perfection in the work, are found in men content to labour for wages which seldom exceed 22s., and often fall to 15s. a week; while the delicate task which is committed to the deft fingers of women and girls is considered sufficiently paid for by 1s. 7d. a day. In the vale of Lac de Joux, almost every cottage is tenanted by a family who divide their time pretty equally between horology and husbandry—the one occupation claiming most attention in winter, the other in summer, when the ground is free from snow, and outdoor labour more profitable. It would be curious to trace the steps by which, slowly, painfully, with much perseverance and a great deal of practice, entirely unaided by books and by technical education in the modern sense, the peasants of Joux have become the most skilful watchmakers in the world. Their knowledge is hereditary. Skill runs in families; and every boy, knowing from infancy what his future occupation is to be, grows up, as it were, in an atmosphere of escapements and dials, mainsprings and pinion wheels, and timepieces duly jewelled. His apprenticeship begins from the period he is capable of watching his father, mother, brothers, and sisters at their toil, and his working-life lasts until he is no longer able to fit together the complicated mechanism. He has his secrets, inherited from his fathers, and as the outsider is rigorously excluded from participating in the craft, for fear he should make the trade too cheap, or carry his training to another land, the business of La Vallée is a close corporation. The art and mystery of fine and complicated watchmaking are taught only to the members of the family who have been born and bred in the profession. It is the same with a score of other small industries, not only in the Black Forest and other parts of Germany, but in the French and Swiss Jura also. One valley is devoted to the making of wooden pipes, another concentrates itself on spectacles, a third makes a sufficient livelihood out of paste diamonds, a forth from clock cases, while the adundance of wood has in another given rise to an extensive business in the making of pill boxes. Manufacturing on a larger scale has been of course unprofitable in a region without coal, and, until a century ago, almost destitute of roads. But the farmers required scythes and sickles, and the watchmakers fine files, and an industry in the making of these articles grew up at Vallorbe. Yet, though the files of this confederacy of Communes are almost as celebrated as the watches of La Vallée, such tools are now for the most part composed of English steel, treated after a manner peculiar to the district, because, without coal, it is no longer possible to smelt the native iron in a sufficiently economic fashion.

Of late years a scheme for the creation of British industrial villages has been frequently mooted. It would, after all, be nothing more than a revival. Particular places were at one time famous for particular arts, pursued, as in the instances mentioned, by whole families, until a sort of hereditary caste, with all the skill for which artistic castes are noted, practised straw plaiting, or chainmaking, or the forging of whittles, or the manufacture of mousetraps. Indeed, all the great industrial towns were at one time industrial villages, which, again, had their origin in industrial cottages. Their day is, however, past. Luton, it is true, remains, with the villages round about, the centre of straw-plaiting, and chains are forged by numbers of families in the Black Country, though under circumstances on which the philanthropist cannot look with much favour. But the great factories have almost overwhelmed these little industries. The big Companies have ruined the "garret masters," just as the great proprietors have absorbed the yeomen, the Franklins, and the "bonnet lairds," or the farmers on a large scale the little folk who cultivated a few acres. To revive such industries is no longer economically possible. The only chance for industrial villages is in the smaller arts which cannot well be practised in manufactories, such as wood carving, hammered metal work, or even toymaking of the better type. Toymaking, however, is now so poorly paid that, except as an amusement for the long winter nights, it would scarcely prove attractive. Only the clever and fanciful Parisian can make a steady and and decent living out of the industry. The business is usually supposed to be concentrated in Nuremberg, though, like the quaint wood-carving sold in that city, most of it is absorbed by the Thuringian peasants, or by the miners and woodmen of the Black Forest. Much of it is also done in Switzerland, where the long winters, during which, for weeks at a time, all communication with the world is stopped, and out-of-doors work made difficult, lend themselves peculiarly to these little industries. It is then that the pretty chamois heads in beech, or the humorous nut-crackers in the shape of Reichskanzler's head, are produced at prices which, though trifling, are yet almost clear gain to the peasants, debarred from any more profitable occupation. In Norway we see something similar, owing to causes of much the same character. But for the very opposite reason, it is scarcely advisable to try and imitate such unprofitable art in this country. What ought to be tried—and there is no reason why the attempt should not be successful—is to encourage the practice of the more paying form of wood carving, hammered metal work, and the like, good specimens of which are always safe to bring a high price. These branches of handicraft are, moreover, safe from ruinous competition by machinery and great factories. They can be pursued without the dread of finding the outcome hopelessly undersold by competition, and hold out some promise to their votary, of rewards commensurate to his talents and ingenuity.

The Horological Schools at the Paris Exhibition.

IN his report on Watchmaking at the Paris Exhibition, Mr. James Bray says (speaking of the school exhibits):—

There is one other important exhibit in the British section—that of the Watchmaking School of the British Horological Institute—the work being that of the students, who are all young men who have not, previous to entering the school, worked at the trade. The specimens of work shown are very good, especially in turning; although, as compared with the work exhibited from the Continental schools, the course of instruction does not appear to have such a wide range, almost all the work shown being that usually done by the finisher and escapement maker. From the opportunities afforded for comparison, the pivoting appears to be better than that produced in Continental schools by lads of a corresponding age and period of instruction; but there is nothing to lead one to suppose that the students possess such a desirable all-round knowledge as that shown by those of many similar Continental institutions.

The most important Parisian exhibit is, I consider that of the Horological School, showing, as it does, the efforts which are being made to give a thoroughly practical and scientific training to young watchmakers. The specimens of work exhibited are executed in the different stages of the course of instruction through which the students pass. Through the courtesy of M. Rodanet, the president, I was enabled to visit this school, and cannot speak too highly of the method of instruction and the results obtained. There are at present about 60 students under instruction, about one-third being boarders, the remainder living with their friends. The students during the first year are taught to turn and file and make numerous simple tools which they will require during their course of instruction. Part of each day is set apart for theoretical instruction and drawing bearing directly upon the work they have in hand. This system is followed throughout the course, the scientific, drawing, and theoretical instruction always bearing directly upon the practical work, in the advanced stages as in the first year. The students of each year work together in separate rooms, each room having a separate teacher for practical work.

The exhibit from the Besançon Horological School is most interesting, showing, as it does, the very complete course of instruction in theoretical and practical horology through which the students are put. I find, upon reference that this school was founded in 1861, the Municipality voting £1,000 to start it, and for the purpose of maintaining it an annual grant of £1,000; the teaching being gratuitous to the sons of parents residing in the town, a charge of £8 per year being made to all foreign pupils; the accommodation being for 80 to 100 pupils. This shows the importance attached to this system of instruction by the authorities.

The Horological Schools here (in the Swiss section), as in the French section, make a very interesting display, there being such exhibits from all the great Swiss watchmaking centres, showing what a thoroughly practical and scientific training a workman can obtain at a very small cost to himself. The specimens of work shown are of a very high order, and the system of instruction appears to be most perfect.

The conditions were not very favourable for inspecting the exhibits, it being impossible, excepting in two or three instances, to examine them, owing to the glass cases being locked. So far as I could see, there did not appear to be anything new of importance. The admirable trade journals which are published in every watchmaking centre give publicity to new ideas and inventions of interest to the trade, so that the general advance is but little noticed. No doubt many of the things shown were made expressly for the Exhibition, and some of them had probably done duty in this way before; it was also evident that in many instances the exhibits were not the production of the firms showing them, but this is of little moment. In comparing them with those of our own country, one cannot but observe the greater variety of watches in size, quality, and design; this may also be noticed in all the Parisian shops. The production of an article to meet the requirements and suit the tastes of customers in all parts of the world is evidently a matter of the first importance with Continental manufacturers. This does not appear to be the case with English firms. They have decided upon what they consider an ideal type of watch, and if the public do not like it they must go without, so far as they, the manufacturers, are concerned. For service I have seen nothing which I consider an improvement upon the best type of English watch, such as is turned out by many of our good firms; the symmetrical proportions externally, and the general disposition of parts and caliper of the movement, do not seem to allow of any improvement where utility is the main object; but if watches of a more ornate character are required, it is necessary for the retailer, or, for the matter of that, the manufacturer, to purchase from some Continental maker, or what perhaps more often happens is, the customer postpones his purchase until visiting the Continent. It would seem desirable that some effort should be made to secure a greater portion of this class of trade.

As regards the workmanship in best instruments of Continental make, the quality appears quite equal to anything that can be produced in this country, nor can one find fault with the general disposition of the various parts; but there is a feeling that more thought may have been given to ornamentation than to matters more essential in an instrument of precision. The extreme delicacy to which some of the parts are reduced renders them liable to injury and difficult to repair, requiring more skill than is often found in an ordinary repairer. The compensation balances do not appear so good as those found in English watches of the same class.

In high-class work of this description I consider we are still unsurpassed; but in watches of fanciful design and artistic decoration of case, and all kinds of complicated work, it can scarcely be said that we attempt to compete at all with Continental makers. When one observes the large stocks of this class of watch in all the watchmakers' and jewellers' shops in Paris, and considers that all the American, Oriental, and Colonial tourists who visit Paris also invariably come to London, it certainly seems reasonable to suppose that a fair proportion of this trade could be secured if we were prepared with native productions of this description.

The exhibits in machine-made watches are not at all in proportion to the progress that is being made in this direction. To make a comparison it is necessary to consider what is being done by firms not showing in the Exhibition. It is difficult to draw a line as to what should be considered a machine-made watch. I think only those in which all the parts are made by automatic machinery, and but little skilled labour is required in their production, can be fairly called machine-made. This method is mainly that of all the American watch companies who turn out enormous quantities annually; there are also Continental and English firms working upon the same lines, but not to anything like the extent of the Americans. The output from the English firms is far greater than is generally known, and is steadily increasing; their productions are not widely advertised after the manner of the Americans—as a rule they appear to be content to allow the retailer the credit of making the watch, the top plate being usually left grey to allow of any name being engraved upon it. I suppose this is a concession to the *amour propre* of the shopkeeper, who likes to be thought the maker of his wares, and he no doubt also takes into consideration the advertisement he obtains.

There is a steady increase in the use of machinery in the manufacturing of high-class work. In the earlier stages this has been customary for years, and latterly improvements have been made; and now, up to a certain stage, the various parts are interchangeable. There is a steady advance in the application of machinery, or perhaps it would be more correct to say, costly and ingenious tools, by the aid of which the more delicate parts of the watch are operated upon. These tools are often peculiar to a firm, having been designed to meet their own requirements. By this means the old style of skilled hand labour is being gradually superseded, and the manufacturer is able to produce high-class work with greater facility. Although skilled labour is still necessary, the manufacturer is not so dependent upon men of exceptional ability as was formerly the case; moreover, a watch can be completed more quickly, and at a less cost, although the latter is neutralized to a certain extent by the cost of tools and machinery.

It may be accepted as an axiom, that the higher the class of watch the greater must be the amount of hand labour employed upon it, especially during the latter stages of making, and it seems unlikely that this class of work can ever be produced at a low price; neither do I think the enormous number of cheap watches turned out annually will affect the demand for watches of the highest class. There will always be a certain percentage of the more wealthy section of the community who will require watches of this description.

That which most impressed me was the exhibits of the Horological Schools. In this matter there can be no doubt we have a great deal to learn from our Continental rivals. The particulars of the working of these schools have been so often described in the various trade journals, that beyond what I have previously mentioned, there is no need to go into further details here, as they are all worked practically on the same lines. Although I had a knowledge of these institutions from the reports published from time to time, I was not prepared to find such a high standard of proficiency as was shown by the whole of these exhibits. As compared with the British Horological School, the system of instruction is far more comprehensive and of a much wider range, commencing as they do, in the larger work, with forging and fashioning the pieces from the raw material, advancing to clockwork, ordinary and complicated watches, to marine chronometers. Where the work of the English School could be compared, we certainly do not appear to a disadvantage; the pivoting being decidedly better than that of a school of whose work I had an opportunity of making a minute inspection. There I found it is the custom to finish the pivots with a Jacot tool, a method which I was given to understand is common to all Continental work. Pivots made in this way have never a perfectly square shoulder, and there is always a lump more or less in the angle, which should be a right one, formed by the pivot and shoulder. I have never yet seen such perfect pivots as those turned by hand with a graver, and much doubt if this can ever be done equally well by any mechanical method. Apart from this tool, which can only be recommended to repairers of a cheap class of work, and should never be allowed to be used in schools, I consider the system of instruction most admirable.

Having seen from time to time discussions upon the system of instruction at the British Horological Institute, in which machine tools such as those used in factories were advocated for use by the students, I endeavoured to ascertain, as far as possible, what was being done in this direction on the Continent, and could not find any instance where automatic machinery is used. There may be some tools in use in factories that might perhaps be introduced into schools with advantage, but not those whose only merit is their rapidity of production. Tools of this class can usually be managed by a machine-minder, and certainly have no place in a school.

What should be aimed at in these institutions is, to teach craft—teach the student to fashion pieces from the raw material by the skill of his own hands, and at the same time teach him the mechanical principles underlying each operation, and the properties of the substance being worked upon—teach him to proceed intelligently about anything he may do. It can be of little use to place him by a machine, where he may fold his arms, and see, for instance, so many gross of screws made automatically in so many hours. This certainly is not the object of watchmaking schools.

In the Exhibition, only the schools of Switzerland, France, and our own country are represented; but there are similar institutions in Germany and Austria, which are conducted much upon the same lines, all being largely subsidized by the State and Municipal authorities.

This subject of training workmen, I think, is the most important one of the present time. The conditions of trade have entirely changed since our reputation as watchmakers was made. In the past, the employer was a practical man, worked at the board, personally superintended the work, and instructed his apprentices. The term of service (seven years) was sufficiently long to enable the employer to recoup himself for the loss sustained during the first two or three years, during which time the apprentice, if being properly instructed, is earning nothing. Under the present conditions, the term of apprenticeship has been reduced to about four years. Should the employer adopt the proper course of instruction, he cannot hope to reap any benefit from the apprentice, his time of servitude expiring at the period when his work has become of some value; consequently, the important elementary instruction is often omitted, and he is put to perform work which he is not competent to do properly, in order that he may earn something. At the end of the four years, unless he possesses exceptional abilities, he has but a very imperfect knowledge of his trade. A lad fares but little better if apprenticed to a larger firm. There the employer, even if a practical man, does not work at the board, he being too much engaged in the general management of the business. A lad apprenticed with such a firm probably has to pay a heavy premium, and is dependent upon the goodwill of the workmen for the greater part of his instruction, and ofttimes, unless he be a lad of some spirit, becomes the drudge of the workshop. Many of the most competent men will not take apprentices at all; the conditions being insufficiently remunerative for the trouble and loss of time which apprentices entail.

The result of all this is, the majority of workmen have but a very limited knowledge of their trade. This applies particularly to repairers, in whom a greater knowledge is necessary. The difficulty of obtaining good workmen of this class is admitted to be increasing. This may be due in some measure to the increased demand. The public are daily becoming more exacting in the matter of time, and often expect far greater accuracy than their watches are calculated to attain. There is also a very large increase in the number of high-class adjusted watches in wear, and many of these are ruined, or can only be restored to their original condition at considerable cost, through having been in the hands of an incompetent man.

There is no doubt in my mind that it is to the watchmaking schools we must look for our highest-class workmen in the future. I consider this system of instruction far preferable to an apprenticeship under any circumstances; the student, being instructed by several teachers, is likely to have more liberal views and to develop more originality than if taught by one man, when there is the danger of his ideas becoming cramped, and running in rather a narrow groove. Besides this, the capabilities required to teach in all the subjects bearing upon the trade are but rarely possessed by one man.

One cannot but observe the great importance attached to this matter on the Continent, by the way in which the schools there are supported. These institutions must annually pass a large number of men into the labour market. I am told such men much more readily obtain appointments than others not similarly instructed; and almost without exception, the foremen and directors of labour are men who have passed through one or other of the watchmaking schools.

In comparing what has been done in this direction in our own country we find we have the British Horological School, one at the Polytechnic, one at Coventry, and one at Edinburgh. The first-named is conducted upon somewhat similar lines to the Continental schools; there being four teachers, two practical, one for theory, and one for drawing.

The Polytechnic School is carried on more in the nature of the apprenticeship system, there being only one teacher. In the Coventry school the teaching is similar to that of the British Horological Institute, and in Edinburgh the teaching is, I believe, principally in theory and drawing. These institutions, unfortunately, do not meet with the support from the trade which they deserve; the apathy and indifference shown in this matter is much to be regretted. A small annual subscription from anything like a fair percentage of the trade would enable a great deal to be done which is now impossible, and municipal authorities can hardly be expected to do much in a cause in which the trade feel disposed to make but little sacrifice. Much could be done by employers in using their influence with their workmen, and granting them opportunities to attend evening classes bearing upon their every-day work, which would be to the mutual advantage of both. We have, no doubt, for some years been trading upon our reputation, which is the working man's capital. Judging from what I have seen in Paris and the Exhibition, I consider our supremacy is seriously threatened, and unless the trade can be brought to see this, and encourage the scientific training of workmen, as is done on the Continent, I am afraid the time will come when it will be necessary to import high-class workmen in order to produce the best class work, for which we have always been so famous.

There are to a certain extent encouraging signs—a turn towards more modern and improved methods of manufacture, and increased interest in the scientific training of workmen; but it will be noticed that many of the firms who are upholding our trade here are not Englishmen, but men who have had all the advantage which the training in the Continental schools give.

I do not want to be thought a pessimist. I have given this matter some considerable thought, and have candidly stated my convictions. I have every belief in the sterling qualities of my fellow countrymen, and feel sure, if they can be brought to see the necessity of getting out of the old grooves and advancing with the times, these qualities will bring them to the front again as in the past. Should any remarks I may have made tend in this direction, I shall be happy in feeling that this report has not been written in vain.

Trade Journals.

TRADE journals as means of finding out new customers, offer some special advantages to business men. These advantages may be classified as follows:—The trade journal, particularly of the highest grade, often obtains a reputation as an advertising medium so peculiarly its own, that outside parties get in the habit of resorting to its pages, as occasion may suggest, in order to keep posted about the introduction of new things, or to ascertain if there is any recent improvement which could be used with advantage in their business. No daily print could be depended upon to supply that sort of information.

The trade journal is not ephemeral, like the daily sheet, which is rarely preserved beyond the date of its issue, and which is difficult to find twenty-four hours afterwards in the homes of its patrons. Indeed, the trade journal is filed for further reference by some of its subscribers with as much care and regularity as a receipted bill; hence, an advertisement which, in any daily paper would have ceased to do service, may attract attention again at some accidental moment, and become the adventitious means of an order.

The trade journal commonly prints in each edition a classified list of advertisements and an alphabetical index to advertisers, thus supplying easy access in every essential detail, and saving the interested eye from a painful search through page after page for any business announcement of the desired sort.

The trade journal represents, to a remarkable degree, a community of inter-related and sympathetic interests, bounded by certain industrial limitations, and is restricted by its specialty to a particular range of inquiry and discussion, so that the advertiser is able to determine beforehand, with considerable certainty, the specific scope of appeal at his service, with its value to him as a vehicle of publicity.

The trade journal has for its subscribers and readers an exceptionally intelligent class of persons—men who have brains as well as culture, solid judgment besides education, making them the cream of the inhabitants of the land; hence, persons ready to consider, in the right spirit, fresh ideas, new projects, original inventions, useful improvements, and radical innovations.

The trade journal, in possessing such subscribers and readers, has patrons with a superior measure of purchasing power; for it is a demonstrated fact that, in this country of equal political rights and of equal opportunities, the great bulk of the wealth is in the hands of intelligence—ignorance and poverty going together.

The trade journal, on account of its special field of service, sometimes furnishes a direct approach to capable purchasers, nearly every one of whom may stand in need of the article advertised, which would be much cheaper and far more effective than any appeal to an indiscriminate mass of readers such as that represented by a daily newspaper.—*British Mercantile Gazette.*

SUICIDE IN NEWCASTLE.—Mr. Theo. Hoyle, city coroner, held an inquest on the 17th ultimo, at the Stone Cellars Inn, St. Lawrence, Newcastle, on the body of George Bullock, silversmith, 57 years of age, who died in the jeweller's shop of Mr. Craig, 37, Dean Street, on the 16th ultimo. James Craig, son of Mr. R. M. Craig, jeweller, 37, Dean Street, deposed that deceased had been drinking very heavily for the past few weeks, and during the last two years witness had often heard him threaten to poison himself. On Monday morning deceased came to the shop under the influence of drink. He walked into the work rooms, where he was seen to tamper with some poisons. He was cautioned to let them alone, but whilst witness's attention was engaged at some work he swallowed a quantity of gilding solution, containing cyanide potassium, from the effects of which he quickly died. The jury returned a verdict that deceased poisoned himself whilst suffering from the effects of excessive drinking.

Memorandum on Exhibitions held in Great Britain and Ireland.*

BY THE SECRETARY OF THE SOCIETY OF ARTS.

(*Concluded from page* 147).

THE Colonial and Indian Exhibition, held in 1886, was on a different basis to its predecessors. It was under a Royal Commission, the president of which was the Prince of Wales and the Secretary, Sir Philip Cunliffe-Owen.

With but few exceptions of any importance all the colonies and dependencies of Great Britain took part in it:—Canada, New South Wales, Victoria, South Australia, New Zealand, the Cape, the West Indies, &c. Our great Indian Empire also contributed very largely.

Though it was not therefore an international exhibition, the organization necessary was on the same scale, and of the same character, as would be required for an international exhibition.

The resources required were, in the first instance, provided by a guarantee fund of £219,430.

As regards finances, the total receipts of the exhibition amounted to £249,861, the total expenditure to £215,218, thus leaving a surplus of £34,642. £205,840 were received for the admission of 5,550,745 visitors (about 8·7d. per head). Royalties and concessions brought in £24,250; sales of fittings and exhibits, £11,760.

The buildings cost £36,228, and rent £17,978; salaries and wages, £38,107; electric lighting and buildings, gardens, and fountains, £32,787.

There were no jury awards, but a commemorative medal and diploma were presented to each exhibitor.

In all these exhibitions entrance was obtained by (i.) payment at the doors, (ii.) tickets purchased beforehand, (iii.) season tickets, (iv.) passes to exhibitors and executive. The price of admission was 1s. each day, except on Wednesdays, when it was 2s. 6d., but the purchaser of a combined railway and entrance ticket paid considerably less than the full price in addition to the railway fare. It should be mentioned that at none of the above exhibitions were exhibitors charged for space.

In addition to the exhibitions above mentioned, of course many special exhibitions have been held in London. Prominent among these were the Loan Collection of Scientific Apparatus (1876), and the Smoke Abatement Exhibition (1882). Both these were held at South Kensington. The former was under the authority of the Science and Art Department, and was thoroughly international, for the most interesting and valuable examples of scientific apparatus, historical and modern, were collected from every part of Europe. The latter was organised by a private committee; its object was to inform the public as to the best means of obtaining and utilizing heat without vitiating the atmosphere. In connection with the Smoke Abatement Exhibition an extensive series of tests of domestic fire-grates was made, and on these the awards of medals given were based.

Exhibitions of various characters, which have been in the nature of commercial enterprises, have also been held in the Crystal Palace, the Alexandra Palace, the Agricultural Hall, Islington, and elsewhere. Nor would the list of London exhibitions be complete without reference to the American Exhibition (1887) at Earl's Court, with its successors the Italian Exhibition (1888), and the Spanish Exhibition (1889), or to the Irish Exhibition (1887) at "Olympia," Kensington, and the Danish Exhibition (1888) at the Horticultural Gardens.

II.—PROVINCIAL EXHIBITIONS.

Besides the London Exhibitions already referred to, a great number of exhibitions, most of them not international even in name, and probably none of them owing very much to foreign assistance, have been held in different parts of Great Britain. The first of these was at Cork, in 1852, and the next at Dublin in 1853. Dublin also had exhibitions in 1865 and 1872. With these exceptions, until the very successful exhibitions at South Kensington attracted public attention, no provincial exhibitions of importance appear to have been held in this country. The magnificent Art Treasures Exhibition of 1857 in Manchester, though its special nature takes it outside the scope of this notice, may just be mentioned. It produced a revenue of £13,520, the number of admissions was 1,336,715. There have also been other Fine Art Exhibitions, but none so good or so successful. In 1884 an Exhibition of Forestry was held at Edinburgh. In 1886 an International Shipping Exhibition was held in Liverpool, followed by a second General Exhibition in 1887. Financially neither of these was very successful. There were also exhibitions, some of which bore the title of international and others not, at Newcastle and Edinburgh in 1886, at Manchester in 1887, and at Glasgow in 1888. These last four exhibitions, though they contained comparatively few contributions from foreign countries, were all on a scale, entitling them to rank with any except the great Exhibitions of London, Paris, Vienna, and Philadelphia. The attendances at Manchester and Glasgow were higher than at any of the recent London exhibitions, and not far behind those of the 1851 and 1862 Exhibitions. Much experience was gained at them, and they certainly should not be overlooked by those whose task it may be in the future to organise an international exhibition in any other country.

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* This memorandum was prepared by the instructions of the Council, in consequence of a request from the Secretary of State for Foreign Affairs, who had been applied to by the American Minister for information on the subject of international exhibitions in the United Kingdom. Mr. Lincoln had been moved to apply for the information by the Mayor of Chicago, acting on behalf of the committee who are endeavouring to arrange for the holding of the proposed United States Exhibition of 1892 in that city.

A few details of these exhibitions may now be given.

Cork.—At Cork, in 1852, there were 74,095 visitors. The exhibition was held in the Corn Exchange of the City, and was on a small scale. It was confined to Irish industries alone.

Dublin.—Of the Dublin Exhibitions the first, in 1853, was due to the liberality of Mr. William Dargan, who contributed a sum of not less than £80,000. A chief feature of the exhibition was the fine collection of Irish antiquities which it contained. It does not appear to have been of a genuine international character. The exhibition held in the same city, in 1865, was also aided by the liberality of a prominent citizen, Sir Benjamin Guinness. There were over 900,000 admissions. This was the first exhibition at which the experiment was tried of opening in the evening. At the third exhibition in Dublin, in 1872, there were 420,000 visitors. This did not profess to be international, and indeed it was almost wholly Irish.

Liverpool.—The first Liverpool Exhibition, in 1886, was, as its name—The International Shipping Exhibition—implied, devoted to maritime matters. The total receipts were £131,032, the expenditure £150,167. The deficiency of £19,135 was made up from the guarantee fund of £87,474. There were 2,468,098 visitors, who paid amongst them £102,711. The buildings covered 58,000 square yards, and cost about 17s. per square yard. Financially, the second Liverpool Exhibition, in 1887, was less successful even than its predecessor, for its promoters had to call up the whole of their guarantee fund of £34,289 to cover the loss they had made. This exhibition had a large amount of contributions from the Colonies. At both exhibitions diplomas, supposed to represent gold, silver, and bronze medals, were awarded.

Newcastle.—The Mining, Engineering, and Industrial Exhibition at Newcastle, in 1886, was visited by 2,092,273 persons. No report or financial statement has been published, certain matters being still (October, 1889) under dispute, but the exhibition was stated to have been a financial success.* Its most important feature consisted of the mining exhibits; the illustration of shipbuilding was also very fine. The guarantee fund amounted to £35,000. Though called international, there do not seem to have been any foreign exhibitors. The charge for space averaged 2s. 6d. per square foot.

Edinburgh.—The total receipts at the 1886 Edinburgh Exhibition amounted to £110,882, of which £83,040 was from admissions, £15,309 from rent of exhibitors' spaces, and £4,560 from refreshment contracts. The total expenditure was £105,326, so that there was a surplus of £5,555. The buildings cost £39,869, salaries and wages £10,896, electric lighting £6,854. The number of visitors was 2,769,632. Jury awards were made, but no actual medals were given. The exhibition was general in its character. There were few if any foreign exhibitors. The reproduction of a portion of Old Edinburgh in the grounds was a very popular and attractive feature. The buildings covered 39,950 square yards.

Manchester.—In 1887 Her Majesty's Jubilee was celebrated in Manchester by the holding of an Exhibition of Arts, Science, and Industry, which was not specially international, and had no foreign sections. It was visited by 4,765,137 persons. The receipts from admission amounted to £96,969. The total receipts were £268,290, the surplus being £46,977. A charge for space of 2s. 6d. per square foot was made to exhibitors, the receipts from this source being £22,280. £52,380 were received from royalties and concessions, of which £44,016 were paid by the refreshment contractors. The sale of the buildings, &c., realised £12,540. The subscriptions to the guarantee fund amounted to £115,307. From amongst the guarantors a council was formed, who had the disposal of the surplus. The exhibition was regarded as extremely successful, a principal feature in connection with it having been the magnificent collection of English pictures painted within the last fifty years. It was situated in the neighbourhood of Old Trafford, on the outskirts of Manchester, and had easy communication by cab, tram, and railway with the city. It was at first intended to award medals, but after much consideration it was determined that there should be no awards of any sort whatever. This decision was cordially approved by the exhibitors, and is believed to have given general satisfaction.

Glasgow.—In 1888 an Exhibition of Industry, Science, and Art was held at Glasgow. This, though nominally international, did not contain any very important contributions from foreign countries. Like its predecessor in Manchester, it was very successful, both financially and as regards the number of visitors. The receipts from all sources amounted to £225,928, of which £162,933 were from admissions, and £43,952 from royalties and concessions. A charge of 2s. a foot for space made to exhibitors brought in £15,955. The lighting cost £9,972, the illuminated fountain £5,248. The music and other entertainments cost £19,747. The cost connected with the building and grounds amounted to £97,222. The balance of profit was £40,713. The number of visitors was 5,748,379.

As at Manchester, there were no jury awards, and it is not believed that any exhibitors were kept away by the fact.

The grounds surrounding the buildings were very extensive. The show of machinery was specially fine, as was also that of ship models. There was an Indian Court and a Canadian Court, but very few contributions from foreign countries.

To complete the record it may be worth while to mention the fact that many exhibitions of importance have been held in the British colonies, though any details about them would be outside the scope of this memorandum. Melbourne had exhibitions in 1854, 1861, 1872, 1875, 1880, and 1888. An intercolonial Exhibition was held at Sydney in 1870, and an international one in 1879. In 1883 an exhibition was held in Calcutta, and in 1877 one at the Cape of Good Hope.

Proposed Mining Exhibition.—It is proposed to hold a mining exhibition of Transvaal products in London, Paris, Berlin, Amsterdam, and New York. The promoters urge that the scheme will be of great benefit to the Transvaal, that it will improve business, induce firms to open branches there, and that it will facilitate the formation of new mining companies. They maintain that as the majority of European investors have little idea of the nature and extent of the different ores found in the country, such an exhibition, which is intended to include the display of practical operations, is sure to be a success, and will attract many visitors. Liberal terms are offered to exhibitors, and the scheme altogether seems a likely one.

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* Since the above was written an announcement has been published that the surplus amounted to £4,388.

A Word on Advertising.

OF all modern commercial developments that of advertising, perhaps, has been the most considerable and the most rapid. So remarkable has this growth been that many individuals of the older school still look upon it with extreme disfavour. By them it is considered contrary to the ethics of trade, and an illegitimate method of competition. In fact, all competition is thought to be immoral by this older generation, and of course there is every reason, or there was every reason, for them to think so years ago, when competition was unknown and prices double what they are now.

Things at the present time, however, are fined off, and profits all round become smaller. Under great competition profits become so fine that they cannot be seen at all ; but this is going to the other extreme, which is just as contrary to commercial morality as the older generation consider advertising to be.

"Is advertisement a necessity?" is a question frequently asked by one manufacturer of another ; and the answers are invariably the same, though of two kinds. The man who has advertised judiciously replies unhesitatingly, "Yes — advertising is a necessity" ; while the other, who has been either too old-fashioned or too stingy to advertise, replies, "A necessity ? Certainly not ! I never advertised in my life !" Such an answer is, of course, as vague as the mathematician's "unknown quantity," and is illogical and unreasonable. A man may do a business, and a good business, without the aid of advertising, but he can never tell how much more business he might have done had he enlisted the services of advertisement. The man who thinks advertisement unnecessary in his business is just as backward in other respects. Perhaps he keeps travellers, and, as he says, "advertises himself personally." This is all very well ; he may keep his travellers, and they may be admirable travellers, but however good they are and however numerous they are, they cannot call on four or five thousand people at short intervals, and they cannot be handy just at the moment when factor, merchant, agent, or shopkeeper is ready to buy. Of course there is little doubt but that travellers are the most useful form of representation, but they are also the most expensive. They may be able to send home their big lines, but the profits on these lines will be very considerably reduced by the expenses incident to a traveller's movements. The work of a traveller may be very largely helped by a discriminating system of advertising, and half of his expenses saved by judicious use of trade journals.

As advertising has progressed, so has trade journalism, and as the demand has arisen the excellence of such papers has arisen to meet it. At the present time almost every considerable trade is represented by responsible journals, edited by a man intimately informed on the technical intricacies of the trades he essays to help. The staff of such a journal consists of able writers, who have given considerable time to the mastery of the subjects of which they treat, and nothing of interest to the trades is allowed to escape notice and publication.

Publicity by some is decried and derided, but there can be no doubt as to its efficacy in stimulating buyers and manufacturers alike. Buyers become acquainted with every market in which their particular class of goods may be obtained, and makers of these goods see to the excellence of their wares, for they know that if a poor article is supplied their customer will buy elsewhere, as to which "elsewhere" he is perfectly acquainted.

Publicity is of most value where a patent, a registered pattern, a new design, or some novelty, is ready to be brought into the market. Naturally everyone interested wishes to know about such an article without delay or loss of time. If the novelty be of sufficient general interest it will be noticed in detail in the editorial columns of the trade journal connected with the class of manufacture to which it belongs, and it may also be advertised in the publisher's portion of the paper, which, in many well-known trade journals, reaches very considerable proportions. This proportion of advertising pages in trade journals has been decried by many, but, in reality, it is the best proof possible of the popularity and the usefulness of the paper. Not only does it point out that the editorial portion of the paper is of high merit, but it also indicates that those firms who advertise in its pages continuously find it greatly to their advantage to do so.

It is stated by some that they have tried advertising and it has failed. It may sound somewhat blunt, but the failure is undoubtedly of their own seeking. Indiscriminate advertising is as useless as judicious advertising is valuable, and where a manufacturer is about to advertise, it behoves him to consider carefully what methods he shall adopt, and to confer with a representative of the paper in which he proposes to advertise, whose business it is to give him advice and the benefit of his wide and varied experience. If advertising is conducted in this way it is invariably a success, and the advantages reaped are proportionately vastly greater than the small outlay which originally was required.

To consider the matter more nearly, it is a general rule that most success is obtained when novelties are advertised. A general business advertisement is very useful, but the great results are obtained from the prominence given to those manufactures of a novel character, for which every buyer will send. Cases are known where fortunes have been made out of specialities which have been advertised in this way, and firms of considerable importance at the present time have made their position and reputation solely by judicious advertising, without any aid whatsoever from traveller or representative.

It has been argued that advertising is all very well for some trades, but that it does not apply to all; but this idea is a fallacy. Advertising may be made to apply to all trades, and to all branches of trades, with equal success. One manufacturer says he cannot advertise because he supplies factors. What do the factors care as to whether he advertises or whether he does not ? If they have any choice in the matter they would say, "Advertise by all means ; it will be all the better for both of us." Another maker will say, "My goods are not of sufficient general interest to advertise," but the reply to such an objection is very obvious. If the goods are required at all, it is best that those people who desire such things should be continually reminded as to where they can obtain them.

Objections such as these, and their obvious answers, could be easily multiplied *ad infinitum*, but it is unnecessary to carry them further.

There are undoubted signs at the present time that the prejudices against advertising are fast disappearing, and even those who still retain the prejudice are forced to unbend and advertise, and it would be far better if such people did the thing willingly and enthusiastically, as by so doing they would be much more likely to achieve the best results.

Those who have advertised once, and who try to do without advertising, know to their cost the result of such a mode of procedure. A great business house, well known to everyone as large advertisers, one year reduced their advertising expenditure by one-half ; the result was, as might have been expected, a falling off in the amount of business done by just that proportion. In another instance, a large business—which had been well advertised—was bought and worked by a company, whose manager thought, by economy in the matter of advertisements, he might increase the dividend. He therefore curtailed in this direction, with the result that the business fell off, and, continuing, fell off to such an extent that the whole of the advertisements had to be given up in order to show any dividend at all. The result was, of course, the destruction of the whole concern.

Further instances might be cited, but such citation would be scarcely profitable. Every business man of any standing and intelligence knows full well the advantages to be reaped by advertising, and only one more word need be said, and that is that advertising when judicious is always profitable, while indiscriminate advertisements are alike injurious to advertising itself and to the firms who indulge in it. Both alike are sufferers, the latter through want of attention to what is a matter of great importance in business at the present time, and the latter by reason of the bad report that disappointed advertisers are wont to spread abroad, trying thus to exonerate themselves and placing blame where no blame is.

Jewels in Paris.

A PARIS correspondent of *Truth* says :—I was to-day at Bapst's, whilom jeweller to the Crown, to see what things there were to tempt millionaires to buy. When one says "Bapst's," one does not mean Bapst's shop. There is no *shop*, but a house in a modern quarter affecting the style of the Hotel Cluny. Access is obtained by a hall surrounded with paintings and drawings, natural size, of jewelled ornaments made since 1734 for the Crown. In that year a Bapst who had married the daughter of Strass, the inventor of paste, succeeded the latter to the post of jeweller to the Crown—a function that was no sinecure, as the design-books which I was allowed to look through show. "The Crown was always changing the forms of its jewellery," said to me M. Germain Bapst, whose history, in folio, of the Crown jewels has been just "crowned by the Academy," and is a standard library work, as full of matter as an egg is full of meat, but incapable of being brought into a small compass, because abounding with documents taken from ledgers. The rooms in which the Bapsts during this century discharged their functions are all lighted from the top, and I noticed that the iron frames, in which the panes are set, are too close together for a burglar to let even an infant down through them. Whenever a door is opened anywhere an electric bell rings. Before the Revolution, sentinels of the Swiss Guard kept watch and ward at the original house, which was on the Quai des Orlèvres. But it was found that they drew the attention of daring burglars. Hence the substitution of the windowless warerooms lighted from the top. One sees in these chambers no jewellery about, but before counters old customers quietly examine the treasures drawn from dark recesses to be placed before them. One almost requires a letter of introduction to be admitted to see these treasures as a would-be purchaser. There are many things kept as heirlooms, and they would not be sold on any account. One thing is a unique black diamond, set in Indian table-diamonds. The black one is of as pure crystallisation as those encircling it. Therein lies its peculiarity. Sometimes it is lent for demonstrations to Professor Faye at the Ecole des Mines. Louis XVIII. offered £2,000 for it, wanting it for a mourning ring, but was refused. Higher offers have since been made by wealthier fanciers. But it is, like the luck of Eden Hall, not to be parted with. The dream of most of the millionaires' wives is the largest pearl in existence, set with Indian diamonds and mounted as a brooch. It is generally shown with nine smaller pearls, that beat everything of their size and kind in the world in brilliant sheen and freedom from blemish. Baroness Rothschild often looks at it with longing eyes, but she has not yet made up her mind to buy it, though foremost amongst the pearl-fancying ladies of the world. Like the Sibyl's books, the longer it is kept in hand the dearer it is priced, to make up for the interest of money which it devours. It would be just the thing for some *nouveau enriché*, wealthy as Vanderbilt, to offer to a Margaret (Pearl) of his choice. We hear in opera comique of "The Pearl of Brazil." It is a shabby pearl, and so is its sister, the Panama one. I was shown the model of a necklace of the Empress, which had thirteen large Panama pearls intermixed with a quantity of brilliants. If the pearls had been Oriental she could not have afforded to buy them. A precious pendant for the single-pearl brooch aforesaid is the Sancy diamond, which should by right be in the Crown jewels of Great Britain, from which it was purloined by Henrietta Maria, with most of those obtained by Queen Elizabeth from Antonio of Portugal. The Sancy was seized on her person for debt here in Paris, by the Duc d'Epernon, son of her mother's lover—or rather by his bailiffs, to whom her Royal person was not sacred. Mazarin bought it of Epernon, and finally left it with the six Mazarin diamonds to Louis Quatorze. The French rule was that all jewellery belonging to the Sovereign belonged to the State, but this law was evaded by some shabby Kings, who bought of jewellers through their wives or other fair relatives. I was struck, in looking through an old design-book of 1806, with a set of jewels, in sapphire and diamonds, made for Hortense Beauharnais by Bonaparte's order. The price was great, though not exceeding the value. "Where have I seen these jewels?" I asked myself, and then I remembered it was on the head and neck of the Comtesse de Paris, who declared at the party where she wore them that they descended from Marie Antoinette. She really believes they do, though they are as *style Empire* as they can be. This is how they came to the Royal lady in question. Queen Hortense was in Paris in 1832, and ill and hard-up. She asked Louis Philippe and Marie Amélie to come and see her in a *hôtel garni* where she was staying. His Majesty the Citizen King, the only chair being rickety, sat on a box, and Her Majesty the Citoyenne Queen (who was as Conservative and aristocratic as she could be) on the side of Hortense's bed. Hortense wanted, as a stepdaughter of the First Napoleon, and, therefore, dear to "the Liberals," to get a sum of money from the King, but failed. She then proposed the sale of the diamond and sapphire set, which tempted Louis Philippe to take it as an investment; but it was Marie Amélie who bought it. Then it formed a bandeau diadem, to clasp the forehead just above the eyebrows—a mode invented to hide the fact that Josephine wore a false scalp—a comb diadem, and a necklace, brooch, and bracelet. Marie Amélie gave the forehead diadem, necklace, and brooch to the Duchesse d'Orléans, and the comb diadem and bracelet to the Duchesse de Montpensier, who still keeps them. Those of the Duchesse d'Orléans now belong to the Comtesse de Paris, who wears them on all grand occasions and has been constantly photographed in them. The diadem does not look well on her, because she keeps it high up on her head. It rather "swears," in point of style, at the flat fringe which her front hair forms. M. Bapst, however, will not admit this, he having a traditional reverence for the House of Bourbon. Besides, he looks upon himself and his ancestors as being the high-priesthood of the Crown jewels. He showed me every ledger devoted to Crown business, which he has in a place that might be called the archives of the house. All the orders, all the Royal observations are in corresponding order-books, and the collection goes back to the time when Strass resigned his function to Bapst. This collection of ledgers, orders, and designs is unique. Duplicates were kept at the Treasury, but were burned in the fires of the Commune in 1871. Bapst inherited the business archives of Strass, who came in for those of his predecessors. We can thus go back, in the folio volume he has culled from them, to the morrow of the Treaty of Cambrai, when Francis I. married Eleonore of Austria, Queen-Dowager of Portugal.

Artificial Diamonds and other Stones.

A PARIS correspondent says that the display of artificial stones at the Paris Exhibition is said to have been most remarkable, and so perfect was their imitation of some genuine gems as to puzzle dealers and experts. The firm of Regat and Sons, of Paris, produced such charming imitations of precious stones that they are almost justified in grouping them among the genuine jewels. Another interesting exhibit of such artificial stones are shown by Charles Fell, of Paris, who is celebrated as a maker of optical glasses. Those of Fell were not so conspicuous, perhaps, as the stones of Regat and Sons. Still they were remarkable as by some chemical analysis—the same as is applied to precious stones—they were found to melt only at a very high degree of heat, and of course were exceedingly hard, in fact so hard that they would scratch and almost cut mirror glass. Not only in the scientific department, but in optical glass generally, France won distinction. Especially did her makers excel in glass articles for nautical purposes, as, for example, beacon light apparatus and signal lamps for marine ships. Manufacturers exist there who devote themselves exclusively to the production and finishing of such articles. Moreover, no country manufactures so many artificial pearls as France. For this purpose the glass used is the colour of whey, and the glass pearl of bead is filled with a very costly solution prepared from the scales of fishes. A vessel holding a litre, about 1¾ pints English, is worth several thousand francs. They are of irregular sizes and forms, and are made to imitate pearls of black, grey, and other colours. When placed by the side of genuine pearls, even spread out and arranged in the same stringlike beads, it is not easy to discern between the genuine and the spurious. The small imitations can, however, always be detected because of their perfect regularity and superior beauty. It is also asserted that they can be successfully made of the same specific gravity as the real article, so that no other proof of genuineness is reliable except the file. This is a means, since it would sometimes be applied to real articles, which requires the utmost care in the use. In a state whose industries have reached such a pitch of development, in which so much wealth and the love of luxury prevails, and to which the whole world looks by preference to supply the demands of luxury, many articles are brought to perfection and attain importance which would be profitless elsewhere.

Annealing and Tempering Steel Tools.

MR. HUNT, of Pennsylvania, writing in one of the trans-atlantic technical journals gives some advice on the above-named subject, which will be useful to many of our readers. He says :—I have occasion to visit the railroad machine shops and other shops that use large quantities of fine steel tools, such as taps, fluted reamers, thread-cutting dies, milling cutters, etc., and I find that almost all of them lose from 10 to 15 per cent. of these expensive tools when they are first tempered, or as soon as they are put into use, and at least 25 per cent. the second time they are hardened, and about 50 per cent. the third time. To avoid this large loss and annoyance, have your steel annealed by the steel manufacturers in short bars from five feet to six feet long, the sizes you may want, and cut off the required length you may wish for your tools. This will save the forging, and consequently much expense, if your tools have not been overheated, and there is no uneven strain on the tool. If your tool is of such a shape that you must have it forged, do not heat it too quickly ; but thoroughly all the way through, and do not hammer nor bend the tool unless it is red hot. Do not hammer cast steel after the red has all disappeared in any case. You may hammer, blister and shear steel to refine it at a black heat ; but never do this with cast steel, for it will cause your tools to spring or crack. Forged tools should be annealed and roughed out by planing or turning off below the hammer marks, and then annealed again. This will avoid the springing when hardened. To anneal small sizes of steel, use iron pipes, plug up one end and fill up with the tools. Sift in fine charcoal dust, plug the other end, and heat it slowly until it is at a good red-heat all the way through, then bury it in fine charcoal or wood ashes. If you have not wood ashes, use dry sawdust, and in a short time you will have the ashes and the most perfect annealing preparation in the world. Have this in a good tight iron box with a close cover. For annealing such tools as taps, reamers, and milling cutter dies, etc., use fine wood ashes, dish out the centre, and replace the ashes with dry sawdust. Heat your steel slowly to a good blood-red, and bury it in the sawdust, and cover it over with fine charcoal dust or fine dust from round the forge, put on your cover, and let it remain until cold. I always make it a point to get my annealing in on Saturday if I possibly can, and let it remain until Monday or until cold. For hardening I use a good strong salt brine—about three pounds of salt to one pail of soft water, lard oil, and resin—about one-sixth resin to five-sixths of oil. When mixed together, the oil should be quite warm ; also the resin. Pour the resin into the oil and stir it well. Heat your tools slowly and thoroughly all the way through, and then immerse in the salt brine. If a tap or fluted reamer, put it down in the centre of the tub as straight as you possibly can, and move it up and down slowly from one inch to two inches, so as to avoid a water-line, until it is chilled about half-way or one-third through, as near as you can judge. This you can determine quite accurately by the tremble of the tongs, caused by the condensing steam around the tool. The trouble will cease when the tool is chilled about half through. Then put the tool from the brine into the oil and resin as quickly as possible, move it up and down gently for a minute or two, then drop it into the oil, and let it remain until cold ; then take out, brighten, and test the hardness with a small sharp file, and you will find that you have about the right temper required. For cast iron and brass you will require the tool much harder than you will for wrought iron. Large tools after remaining in the oil will sometimes draw the temper a little more than required. If the oil commences to boil by the heat of the large tool, have a pail of boiling hot water close to your oil tub, take your large mill or whatever kind of tool it may be and immerse in the hot water for eight or ten seconds as near as you can judge, and then return it as quickly as possible back to the oil, and let it remain until the oil stops boiling. We will suppose this to be a large mill cut on top and sides. If you are in a hurry for this tool, and cannot wait until it is quite cold in the oil, you may take it from the oil and put it over a clean slow fire and brighten a few of the teeth, and draw the temper at the same time to suit your work, then return again to oil and let it remain until cold. It is the safest way to draw the temper on large tools a little on the outside at the same time the temper is drawing from the inside ; but there is no occasion to draw the temper on most of your tools from the outside. With this process you will see that the temper is drawn from the inside of tools instead of the outside—the old-fashioned way. By tempering tools in this way you have a soft-centred steel. The brine has hardened the tool so far as it is required to be hard, and the oil keeps it hard and allows the centre or thick part to cool slowly. It will not throw your tool out of round, but will run the on centres as true as before it was hardened, Milling-cutters, taps, and fluted reamers require to be hard only on the cutting parts, and with this process you have just what you want, and you can anneal and harden them a dozen times and never break them. The teeth will not crack off as they do in the old-fashioned way of hardening tools.

Chipping chisels, after being forged, should be heated slowly at least three inches from the cutting edge, to take off the uneven strain caused by forging. Never hammer a cold chisel after the red has disappeared, especially on the edges. The corners will break off if you do. Immerse in clean, soft water about two inches, and move the tool up and down slowly, keeping the point in the water at least one inch and one inch-and-a-half, until the water will not hiss on the tool. Then brighten, and draw the tool to a sky blue ; then drop it into lard oil, and let it remain until cold.

If a tap, or any other fine tool, should by chance get too hot or burnt, do not take the tool from the fire but shut off the blast. Get some resin, put it on the tool freely, and let it remain in the fire ten or fifteen minutes, occasionally putting on the resin, and letting the tool down to a good cherry red, and then immerse as above described, and your tool is as good as if it had not been over heated. I do not recommend overheating steel. It should not be heated more than a cherry red for hardening, and should be heated in a furnace if possible. If you have much tempering to do, it will pay you to have one built. A furnace suitable for heating will cost about 125 dols.

There must be many of your readers who can give useful information on the points above mentioned, or, at least, valuable criticism ; but among amateur latheworkers I should like to know what my fellows on your side use as a heating furnace. I prefer charcoal, which, with a bit of sheet iron, and a length of stove pipe (easily rigged up), gives sufficient temperature quickly, and is the best of all heating agents for steel, as it is practically pure carbon.

Alleged Fraud.—Allen Slouard, a watchmaker, of Feltham, was summoned at the Clerkenwell Police-court, on the 20th ultimo, for obtaining from Andrew Conway, by means of false and fraudulent pretences and representations, a parcel of watches, value £6 9s. The case had previously been before the Court, but it was again adjourned for a month.

Board of Trade Returns.

THE clocks and parts thereof imported during November reached the value of £47,827, in comparison with £51,093 in the same month of last year, and £38,287 in that of 1887. The following shows the sources of supply :—

November	1887.	1888.	1889.
From France	£18,124	£21,032	£19,661
,, United States	£7,992	£12,011	£12,088
,, Other countries... ...	£12,171	£18,050	£16,078

The eleven months of this year give a total value of £402,469, against £422,028 in the same period of last year, and £353,718 in the same months of 1887.

The watches and parts thereof imported during November are valued at £64,235, in comparison with £41,434 in the same month of 1888, and £73,499 in the November of 1887. The eleven months of this year give a total value of £632,866 against £537,459 for the same period of last year, and £678,079 for that of 1887.

The plate and plated and gilt wares exported last month valued £46,354, against £46,769 in the November of last year, and £35,965 in that of 1887. The eleven months of this year give a total value of £397,538, in comparison with £358,159 for the same period of last year, and £292,306 for that of 1887.

The total value of imports of every description last month reached £41,303,409. November, 1888, gave a total of £35,223,935, and the same month of 1887 £32,850,321. The eleven months of this year give a total of £389,245,896, against £348,785,401 for the same months of last year, and £327,761,038 for the same period of 1887.

The total value of exports of British and Irish produce for November reached a total value of £22,186,255, in comparison with £19,799,680 for the same month of last year, and £19,177,361 for that of 1887. The eleven months of this year give a total value of £227,188,606, against £214,964,728 for the same period of last year, and £201,012,976 for the same months of 1887.

The Aneroid Barometer:

ITS VARIOUS FORMS, ITS THEORY AND ITS USE, WITH SPECIAL REFERENCE TO THE DETERMINATION OF ALTITUDES.

BY E. A. GIESELER, C.E.

Communicated to the "Journal of the Franklin Institute."

IV. DISCUSSION OF THE CORRECTIONS.

IN order to find, from the reading obtained by a Naudet or a Goldschmid aneroid, the height of the mercurial column of 32° Fahrenheit temperature, corresponding to the same pressure, three corrections are required, viz.: for temperature, for graduation, and for position, the latter not being required when the instrument is used for measuring altitudes only.

Let A represent the reading of the aneroid, T the temperature of the instrument in degrees Fahrenheit, and A_0 the reading that would have been obtained if the temperature had been 32° Fahrenheit, then we have, concerning the correction for temperature:

$$A_0 = A + a\ F(t) \qquad (1)$$

wherein a is the co-efficient for temperature, the structure of the function t for the present remaining undecided.

Regarding the correction for graduation, aneroids are generally set so that at a reading of thirty inches there is coincidence between them and the mercurial barometer, after the correction for temperature has been made on both. The co-efficient of graduation is the difference between one inch of the mercurial column and one inch of the aneroid graduation: this—multiplied by the difference, thirty—reading clearly renders the correction for graduation. Hence we have

$$B_0 = A_0 + \beta\ (30 - A_0)$$

wherein B_0 the height of the mercurial column reduced to the freezing point and β the co-efficient for graduation.

The above described coincidence between the aneroid and the mercurial at thirty inches, even if completely attained, rarely lasts long, and in order to compensate for this a constant must be added to the right-hand side of the above equation. This constant is the correction for position, and is generally designated by the letter C; we therefore have finally

$$B_0 = A_0 + \beta\ (30 - A_0) + C \qquad (2)$$

Proceeding now to discuss the structure of the above function of t, equation (1), it should be remembered that each change in temperature causes two different forces to act on the mechanism. In the first place, the corrugated surface of the vacuum chamber having a greater area than corresponds to its circumference, is expanded too much by a rise in temperature, and this excess of expansion causes a *depression* of the surface. The reason why the latter is not *raised*, instead of being *depressed*, is to be found in the circumstance that in all good instruments it is bent slightly towards the interior, so that, even under a minimum of atmospherical pressure, it will only rise about to the horizontal, but never bulge outward beyond this.

The second force is created by the small quantity of air, present in all so-called vacuum chambers, being expanded by the additional heat imparted to it, thus exercising an inside pressure that tends to counteract the first described force.

In the Naudet aneroid the chamber is exhausted as much as possible, and the inside pressure caused by a rise of temperature under all ordinary circumstances is therefore much smaller than the force caused by surface expansion of the box and pressing such surface towards the interior. These instruments will therefore be affected by a rise of temperature in the same way as by an increase of atmospherical pressure, that is, the reading of the instrument will become higher. Hence the correction for temperature in Naudet aneroids is subtractive for all temperatures above the freezing point and additive for all temperatures below.

From what has been said, it is clear that the second or inside force can be increased by admitting additional air into the vacuum chamber, and it was suggested by Professor Kohlrausch that in this way the two forces might be made to counterbalance each other entirely, thus reducing the correction for temperature to nothing. The impossibility of this was demonstrated by Professor Weilenmann, whose extensive theoretical and experimental researches on this subject rendered the following results:

(1) When the temperatures are plotted as ordinates and the corrections pertaining to them as abscisses, then a parabola is obtained.

(2) The apex of this parabola can be shifted to lower or higher temperatures, by respectively increasing or diminishing the amount of air contained in the chamber.

Although these principles differ theoretically from Bauernfeind's opinion, that the correction for temperature increases in direct proportion to the temperature, yet for Naudet aneroids, with highly-exhausted chambers, there is no great practical difference between both assertions. This will be seen clearly from the following diagram, in the left-hand part of which a correction curve for temperature is shown that was obtained by Professor Weilenmann from actual tests with an aneroid, the chamber of which was exhausted as completely as possible. For all such temperatures as are likely to occur in practical work, this curve does not depart materially from a straight line, which latter would be the expression of Bauernfeind's law in the diagram.

TEMPERATURE IN DEGREES CELSIUS.

Professor Weilenmann's above-named principles have been utilised in the construction of the Goldschmid aneroid for the purpose of reducing as much as possible the correction for temperature. An amount of air corresponding to a few inches of the mercurial column is admitted into the vacuum chamber, thereby shifting the apex of the parabola to near the freezing point, and consequently reducing to practically nothing the corrections in that vicinity. An example of this is given in the right-hand part of *Fig. 3*, where a correction curve is shown for a vacuum box which contained an amount of air corresponding to six inches of the mercurial column. The characteristic differences between this curve and the high vacuum curve in the left-hand part of the same diagram, are at once apparent and strikingly to the advantage of the former. Under the influence of high temperatures the inner pressure now exceeds the force, bending the surface towards the interior; in other words, such influence will act on the Goldschmid aneroid like a *decrease* of atmospheric pressure.

Summing up, we find that the correction for temperature for the Goldschmid instruments in the vicinity of the freezing point is practically nothing; again, that as a general rule it is everywhere considerably less than for the Naudet aneroid or for the mercurial barometer, and, finally, that what little there is of it, is *additive*.

While the Goldschmid aneroid is not claimed to be entirely compensated for temperature, the corrections for the latter are doubtless in it reduced to very small quantities, a table of which, resulting from careful tests made by the manufacturer, accompanies every instrument.

For some of the Naudets in the market, entire compensation is claimed, but if the practical test is made, probably one out of ten will be actually found so, while the corrections of most of the rest will exceed those of the Goldschmid, without the purchaser being furnished with a table for them.

A simple and very effective method of ascertaining the correction for temperature consists in the use of warm, tepid, and cold water baths, and finally the ice bath. By their means the inner temperature of an instrument can be varied from the freezing point upward, to say 100° or more. The observations must, of course, be made together with observations on a mercurial, and both are recorded in about the following way:—

MERCURIAL THERMOMETER.	ANEROID.			
B_0	A	t	A'	$29·094—A'$
1	2	3	4	5
29·149	29·073	67·0	29·016	0·078
29·148	29·070	66·2	29·014	0·080
29·143	29·073	75·0	29·022	0·072
29·132	29·074	74·4	29·035	0·059
etc.	etc.	etc.	etc.	etc.

In this table the letters at the heads of the various columns have the following meaning:—

(1) B_0 is the reading of the mercurial barometer in inches and decimals, as reduced to the freezing point.

(2) A is the reading of the aneroid under the same pressure.

(3) t is the inner temperature of the aneroid in degrees Fahrenheit and decimals.

(4) A' is what the aneroid would have read, if the pressure during the entire series of observations had constantly remained at $B_0=29·094$ (this being the average of all the B_0 of the entire series).

The value of A' is found in the following manner: In the case of the actual example cited here a preliminary determination had been made, showing that 1·000 inch of the aneroid corresponded to 0·970 inch of the mercurial column. If, therefore, in the case of the first observation, for instance, the mercurial barometer had read 29·094 (instead of 29·149), that is, 0·055 less than it actually did read, then the aneroid would clearly have read $\frac{100}{97} \times 0·055=0·057$ less than it actually did read, that is to say, $29·073 — 0·057 = 29·016$. The difference between the value $29·094—A'$ as found for the freezing point and as found for any other temperature renders the correction for such temperature. These differences should be found for the various temperatures from the freezing point upward to, say, 100° F., and then plotted, as shown in *Fig.* 3; from the curve thus obtained a table of corrections is easily deduced.

The correction for graduation has been assumed in equation (2) to stand in direct proportion to the difference 30.—Reading, an assumption which, although not strictly correct, is sufficiently so for most practical purposes.

Each Goldschmid aneroid being furnished with a table of corrections for graduations, as well as for temperature, the owner of one of these instruments is saved the trouble of investigations in this respect.

For Naudet aneroids these tables have to be obtained by the purchaser, through direct comparison of the aneroid with the mercurial barometer, the readings of both being reduced to the freezing point by means of the previously determined correction for temperature. The observations are recorded in tabulated form as follows:—

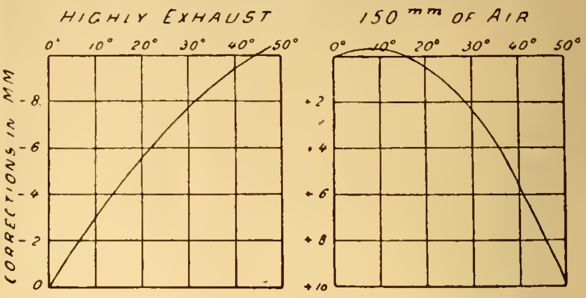

FIG. 3.

B_0	A	t	A_0	$A_0—B_0$
29·970	29·960	72	30·000	0·030
29·420	29·450	76	29·500	0·080
28·870	28·940	78	29·000	0·130

wherein the various letters have the same meaning as in equations (1) and (2). From the table it is seen that in this case the constant correction for position was

$$C = — 0·03$$

and that 1·000 inch of the aneroid correspond to 1·100 inch of the mercurial; the co-efficient of graduation therefore was

$$\beta = — 0·100$$

and by means of these figures a table of corrections for graduation can easily be worked out according to equation (2).

But if it is desired to use the aneroid at great altitudes, then it would not be safe to assume the co-efficient β to remain constantly the same, and the investigation should in this case be extended to lower pressures, either by making comparisons between the mercurial barometer and the aneroid at various altitudes, or by making them by means of the air-pump. If the latter method, however, is selected, then a certain correction of the results will have to be made, the nature of which is explained by Dr. C. Koppe as follows:—

Suppose an aneroid and a mercurial barometer to be at the same locality and subjected to the same atmospheric pressure; and, again, suppose a sudden decrease of the force of gravity to take place there. What influence would such an event have on the reading of the two instruments?

Manifestly the reading of the mercurial barometer would not be affected in the least, the weight of the column of air being diminished in the same ratio as that of the mercurial column.

It would be quite different, however, with the aneroid. While the weight of the column of air has diminished, the elastic force of the vacuum chamber has remained the same; the instrument will therefore record a lower pressure.

Consequently, if a journey is undertaken with an aneroid and a mercurial barometer which read precisely alike, then the coincidence between both will only last as long as the force of gravity remains unchanged. But this force is different in different latitudes and at different altitudes, and from the latter circumstance results the necessity of a correction of such tables for graduation that were obtained by means of the air-pump.

It is clear from the above that a reading of twenty-four inches of the mercurial barometer, taken at the level of the sea under an air-pump, indicates a *greater* actual pressure of air than the same reading taken at an altitude of 7,000 feet above the level of the sea. Hence, a correction has to be *added* to the reading of the aneroid at 7,000 feet altitude, in order to obtain coincidence of such reading with the mercurial barometer. The amount of this correction has been computed by Professor Weilenmann as follows:

Reading (inches) .	31·5	28·0	24·0	20·0	16·0
Correction . . .	0	+0·105	+0·189	+0·270	+0·312

The arithmetical sums of these figures and the corresponding corrections found by means of the air-pump are the final corrections for graduation.

The difficulty caused by "elastic reaction," which was mentioned in the beginning of this article, is, of course, present also in the Goldschmid aneroid, and the above investigations, as well as all measurements of altitudes, should be carried on with due regard to it. The instrument must be given time in order to fully accommodate itself to any sudden changes of pressure.

But while Kroeber found that the Naudet required days for this, he found the Goldschmid practically accommodated after one or two hours. Again, he found the extreme differences resulting from elastic reaction in the latter instrument only about one-fourth of those in the former. Both these advantages in the Goldschmid, as compared with the Naudet, are doubtless due to the extreme simplicity of the former's mechanism, and in view of them it may be safely asserted that the gradual changes of pressure, taking place during ordinary explorations of mountainous country, will not produce any appreciable errors of elastic reaction in the Goldschmid aneroid.

(To be continued.)

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

WE will (says Dr. Bucklin, in a contemporary) continue the consideration of diseases of accommodation. The gradual process by which the lens becomes less elastic while the muscular system is becoming rapidly developed was considered in our last article on diseases of the accommodation. In presbyopia there is no loss in the muscular element which produces accommodation. The lens from its loss of elasticity simply fails to become more convex when the capsules which contain it are relaxed. Errors of refraction, disease of the lens, and the previous use of unnecessarily strong convex lenses may cause the amount of presbyopia found at a given age to vary widely. Thus a person having a myopia of $\frac{1}{14}$ will not require glasses to read with till after he is sixty-two years of age. On the other hand an individual who is hyperopic $\frac{1}{14}$ will require convex seven to read with. In this case the convex seven represents the amount of his hyperopia and presbyopia combined.

In the individual having myopia of $\frac{1}{14}$ his eyes were exactly focused for objects at fourteen inches without the use of accommodation, consequently he would not require glasses till his presbyopia had become greater than his myopia, at which time he would commence to wear the very weakest convex lenses.

There are also many diseases which have a direct influence on the elasticity of the lens. Chronic glaucoma in its early stages causes the accommodation to sink in a similar manner to presbyopia. The failure of the accommodation is, however, much more rapid in this case than in presbyopia, but it is very frequently mistaken in the commencement for simple presbyopia. Persons who are losing their accommodation as a result of glaucoma have large pupils; they see rings about all lights at night, and the field of vision is decidedly contracted on the nasal side of the eye or eyes affected.

Cataractous disease of the lens also influences the refractive condition of the eye before the opacity has become sufficiently general to act as an obscurity to vision. During the early stages of the development of cataract, the lens fibres frequently swell, thus greatly increasing the convexity of the lens. This phenomenon is called "*second sight.*" An individual who formerly required convex fourteen lenses for reading and weak convex lenses for distant vision, finds that he can read without any lenses and possibly requires weak concave lenses for distant vision. This condition of second sight is very frequent during the development of cataract. It is the basis upon which all kinds of treatment for cataract to prevent its development has gained a footing. Electricity once used at this stage gained a great reputation for arresting the development of cataract. The fact was the individuals developed the peculiarity of second sight in spite of the use of electricity, and the improvement experienced was credited to the electricity. Persons not treated by electricity, however, develop the same degree of improvement from "Second Sight." This swelling of the lens, however, only produces temporary improvement in the vision owing to the fact that the obscurity becomes so general that it obstructs the entrance of light into the eye.

The ciliary muscle which, by its contraction, relaxes the capsules of the lens and thus allows the lens to become more convex, may, like any other muscle, suffer from *paresis*, *paralysis* and *spasm* or *cramp*.

It will thus be seen that in young persons, where the elasticity of lens is perfect, we may have defective accommodation, as a result of a diseased condition of the ciliary muscle.

Paresis of accommodation is due to a neurosis usually resulting from some of the acute infectious diseases which produce a partial paralysis of the ciliary muscle. Persons having paresis of accommodation *have*, *have had*, *or are about to have*, a general disease. The paresis is usually temporary and passes away with the improvement of the general health.

The treatment is hygienic and medical, and never ocular unless the paresis leaves a permanent impairment of the ciliary muscles. Ocular treatment then becomes necessary. The conditions to be satisfied then become the same as simple presbyopia, and is treated by convex lenses in a similar manner.

The following case illustrates well the condition of a child suffering from paresis of accommodation: Miss G——, age twelve years. Distant vision perfect. No error of refraction can be found. During the last few weeks she has not been able to read. Convex lenses No. 36 enable her to read fine print, but she becomes rapidly fatigued when attempting to read with the glasses. Enquiry does not bring out the fact that the child's general health has been or is in way affected. The mother has simply noticed that the child has not appeared as lively as usual. Within ten days she is taken severely sick with high fever and is delirious. The attack may have been malarial or diphtheretic. Its cause was traced to a broken sewer pipe. When the general health of the child was restored, the paresis of accommodation had disappeared. Paresis of the accommodation also appears at all periods of life as the direct results of syphilitic diseases.

Paralysis of accommodation indicates complete loss of accommodation. It has for its cause all conditions which produce paralysis in the young or old. Usually the pupil is also paralyzed and widely dilated. The condition can, however, exist without the pupil being affected.

MUSCLES.

Had an individual but one seeing eye, every point regarding adjustment would have been described under the head of accommodation. Having two eyes which must under all conditions be directed at the same point in addition to being focused for that point, the requirements for adjustment become much more complicated. The slightest failure in an individual's ability to accommodate, or fix as well as an inability to exercise these two faculties in harmonious relations to each other, produces visual disturbances. The following are the muscles which control the direction of the visual axes:

The internal recti muscles.—These muscles move the eyes inward. They are the only muscles which rotate the eyes in this direction, which is an exception to any other set of ocular muscles, motion of the eyes in all other directions being produced by two or more ocular muscles. These muscles are much stronger than any other set of ocular muscles for the simple reason that the task required of them during the binocular visual act is much greater than that required of any others.

These muscles are constantly under a severe strain when the eyes are used at the working or reading distance, as the nearest of the observed objects under these circumstances require strong convergence of the visual axes to be constantly maintained. It will be seen at a glance that any failure in the strength of these muscles will cause near vision to be very fatiguing.

The external recti muscles turn the eyes directly outward. The task of these muscles is complete when they have brought the visual lines parallel for distant vision. The requirements of the muscles are very much less than those of the internal recti muscles, and they are consequently weaker muscles, and do not, when weak, cause the same amount of trouble as a like condition causes when affecting the internal recti muscles. *The superior recti muscles* turn the eyes directly upward.

The inferior recti muscles turn the eyes directly downward. A weakness in either one of these two sets of muscles makes it difficult to keep both eyes directed at the same height. The slightest weakness of one of these muscles as compared with the strength of the opposing muscle produces the most serious visual trouble. The eyes are more sensitive to a difficulty of this kind than they are to any other form of muscular weakness.

The superior oblique muscle.—This muscle passes from the apex of the orbit slightly upward and inward toward the nose. It here passes through an opening which acts as a pulley. The muscle then passes back over the eye and is fastened to a point which is some distance behind, outside of and above the centre of motion of the eye. When this muscle contracts, it turns the visual axis downward and out. When it loses its power it allows the eye to turn upward and outward.

The inferior oblique muscle passes from the inner lower margin of the orbit backward under the eye, and becomes fastened to the eye in such a way that its contraction turns the eye outward and upward.

The above muscles acting together, turn the eye directly outward.

Movements of the Eye.—Its motion inward is controlled by a single muscle, the internal rectus; *its motion outward* is controlled by three muscles, the external rectus and the superior and inferior oblique muscles acting together; *its motion upward* is controlled by the superior rectus assisted by the inferior oblique muscle.

Its motion downward is controlled by the inferior rectus assisted by the superior oblique. *Defects of the ocular muscles* produce the following results:

First. Grotesque positions of the head are assumed by the individual afflicted, providing the position of the head will place the eye in such a position that the affected muscle is thrown out of use sufficiently to relieve the annoyance experienced as a result of the ocular muscle being unable to perform the usual task required of it during the binocular visual act.

Second. When neither by favouring positions of the eye or use of the muscles both eyes can maintain fixation, we have all forms of diplopia or double vision. The diplopia arises from the fact that non-corresponding points of the retina are exposed to the same visual impression.

Third. When by a fatiguing struggle both eyes are retained in the position of binocular fixation, the muscle which is weak suffers from the strain which is imposed upon it, and we have muscular asthenopia as a result.

The nature of the above described defects, the many annoying consequences resulting from muscular defects, and the various methods necessary for determining and locating muscular weaknesses will be considered in our next.

The following letter asking for information, which was addressed to Dr. Bucklin by a correspondent, is answered in the succeeding text.

Friend Dr. Bucklin:

Will you have the kindness to explain to me the following case:

A woman, aged 50 years, has been complaining of her eyes a long time, both for reading and the distance, and find her distant v = 20-70. She accepts down to + 36 sph., which gives v 20-40 almost. — 40 sph. does about the same. With the + 40 sph., the three vertical lines are blackest. + 60, 43 or 40 cyls. axis. 180' or 90' placed before the + 40 sphere, makes vision poorer.

On placing a + 40 cy. ax. 90' ○ — 40 cy. ax. 180' in the frame, she has v = 20-30, almost 20-20. 48 cyls. placed the same way are equally as good, each bringing the lines out equally black.

Is it not contrary to the rule to accept a sphere as this woman does?

What I want to know most of all is how to determine (1) when she has the proper cylinders; (2) how to determine whether she needs a stronger — cyl. than a + cyl., or vice versa; (3) which to put on first, the + or — cyl.; how to tell when I have the correct + cyl. before placing the — cyl. before it.

She cannot read the paper with these glasses, $\frac{+\ 48\text{ cy.}}{-\ 48\text{ cy.}}$ How am I to combine the presbyopia with this combination, or must she have different glasses for reading, and what must they be?

If you will oblige me by answering these questions separately, and simplify them as much as possible, so that I can clearly understand them, I will be very thankful to you.

This case, as it stands described, is a peculiar one. The fact, if it be a fact, that she can only read $\frac{20}{70}$ without any lenses, and that she can read $\frac{20}{40}$ with either + or — sphericals No. 40, is remarkable and unusual, but not impossible. These cases usually reject all spherical lenses, or at least greatly prefer the same No. cylindrical lens to the spherical lens. If this party had a preference for a cylindrical lens or not, we are not informed.

This party evidently sees better with a spherical lens of either + or — value than without. The + or — lens *corrects* one meridian, and transfers all the previously existing faults to the remaining meridian. She simply sees a little better with a high degree of simple astigmatism than with mixed astigmatism.

It is contrary to the rule for this class of persons to accept spherical lenses, and I should have been better satisfied if I had seen her accept the spherical lenses, but we have the written facts before us.

The fact that $+\frac{1}{40}$ c. ax 90 ○ $-\frac{1}{40}$ c. ax. 180, produces vision = to $-\frac{20}{20}$, demonstrates that the person has mixed astigmatism. In selecting the cylinders, you take the + or — cylinder which produces the best practical vision for the first cylinder, then cross it at right angles to the previously determined axis with a cylinder of the opposite value, selecting that cylinder which gives the best practical distant vision. Having determined the necessary cylinders in a person who has mixed astigmatism, and is also presbyopia, you will always bring down the + cylinder as a sphere in transposing the combination into a sphero-cylinder, thus:

$+\frac{1}{40}$ c. ax. 90 ○ $-\frac{1}{40}$ c. ax. 180 would read, transposed, $+\frac{1}{40}$ ○ $-\frac{1}{20}$ c. ax. 180. Should the individual at the age of 50 require $+\frac{1}{40}$ at the reading distance to compensate for his presbyopia, the formula for the reading glasses would read $+\frac{1}{20}$ ○ $-\frac{1}{20}$ c. ax. 180. With this lens his mixed astigmatism and presbyopia would be corrected. The individual would not, however, see at a distance through such lenses. The first transposed formula would be his reading glasses.

A New Alloy.

THOSE whose engagements frequently bring them within the magnetic field of a strong dynamo, often have cause to regret that they were wearing a watch at the time. Since the development of electricity has assumed such wide-spread importance, it has become a common occurrence in the trade to receive valuable watches for repair that have been sadly ruined by their owners having come too near a working dynamo-machine. The parts affected are usually difficult or impossible to demagnetize, and hence the cause of much vexation.

It is evident that, in order to avoid this unpleasant experience, some new material must be found, which shall remain unmagnetized when in a magnetic field.

Several alloys have been proposed, and, indeed, tried, but they have hitherto not given complete satisfaction.

Recognizing the importance of supplying the trade with a thoroughly reliable material, which should be in every respect suitable for watchmaking and yet unmagnetizable, Herr C. A. Paillad has given much attention to the subject. He has at last succeeded in producing an alloy of palladium, which he believes capable of withstanding any test, and at the same time to be a thoroughly suitable material for watchmaking purposes.

Four varieties of this new alloy are recommended, and the composition of each kind is shown in the following table.

	Pd.	Cu.	Fe.	Ag.	Au.	Pt.	Ni.
I.	60-75	15-25	1-5	—	—	—	—
II.	50-75	20-30	5-20	—	—	—	—
III.	65-75	15-25	1-5	3-10	1-2·5	0·05-2	1-5
IV.	45-50	15-25	2-5	20-25	2-5	2-5	2-5

Here Pd. = Palladium; Cu. = Copper; Fe. = Iron; Ag. = Silver; Au. = Gold; Pt. = Platinum; Ni. = Nickel.

These four modifications of the palladium alloy are recommended for different purposes:—

Alloy I. is easily made by mixing half the palladium with all the iron and copper, and fusing the mixture with borax and powdered charcoal. The rest of the palladium is then added, and again the mixture is fused. The molten alloy is then poured into moulds.

Alloy II. contains less palladium and more of the copper and iron; it is made in a similar way, and is much cheaper than Alloy I. This alloy may be conveniently used in the manufacture of cheaper watches, or for certain parts of the better-class watches.

Alloy III. is a very excellent material. It is practically unaffected by atmospheric changes. Its electricity is quite independent of variation in temperature. Its astatic properties excels those of Alloys I. and II.

Alloy IV. is the most serviceable of all these alloys, and is likewise rather more expensive. It possesses all the advantage peculiar to Alloy III., and in addition is characterized by great hardness.

The alloys certainly ought to be taken up by watchmakers, for they seem calculated to meet the requirements of a class of people that is daily growing more important numerically, according as the use of electricity develops.

American Items.

The Waltham Watch factory is making 1,000 electrometers for the Thomson-Houston Electric Company. The Company employs 2,750 watch and casemakers at Waltham and 705 casemakers in Brooklyn, a total of about 3,500.

It is calculated that it must take about a million and a half a year to pay the present force of employees at the Elgin Works.

It is said that John C. Dueber will build in Canton, Ohio, during the coming year a handsome residence, of Lake Superior brown stone, with hard wood finish throughout, to cost about 30,000 dols.

One of the features taught students at Hutchinson's school, La Porte, Ind., is the changing or remodelling of watch movements. They select a fair English movement, remove the old mainspring barrel and fusee and chain and by very careful measurements construct a new barrel with teeth like the American mainspring barrel. A new barrel arbor is then constructed and proper click and ratchet work arranged.

At the Elgin factory work is being pushed in all the departments as fast as possible to keep pace with the constantly increasing demand for movements, the call for the higher grades being the greatest. Improvements are being made and facilities increased. A portion of the upper main corridor has been fitted up for the staff pivoting job. Some of the departments not having room enough to comfortably accommodate the required number of operatives, other hallways are being used by bench workers on both the upper and lower floors. When the company built their last addition of department rooms and the various departments were installed, there seemed to be an overplus of room that threatened to be unused for years to come.

Messrs. Rood and Dueber, of the Hampden and Dueber factories, have the matter of purchasing the Aurora works under consideration, and Assignee Evans has informed them that they must be heard from very soon. In case nothing satisfactory develops the entire plant will be sold under the hammer. Another party who seems to be in earnest about purchasing the factory is a Minneapolis capitalist, who has visited Aurora three times. It is said that he would probably pay more than anyone else. The employees of the factory are rapidly scattering, more than 75 of them having gone to other places to seek employment. The new factory at Otay, Cal., is attracting some of them, while others have gone to Elgin, Springfield, Rockford, Canton, and other places.

For the last fifteen or twenty years travellers have occasionally brought specimens of a very remarkable amber from some locality in Southern Mexico. The only information gained concerning it is that it is brought to the coast by natives who say that it occurs in the interior so plentifully that it is used by them for making fires. The colour of this amber is a rich golden yellow, and when viewed in different positions it exhibits a wonderful fluorescence, similar to that of uranine, which it also resembles in colour. A recent specimen is even more beautiful than the famous so-called opalescent, or green amber, found in Catania, Sicily. This material would be extremely valuable for use in the arts. It is believed that an expedition has started for the locality where it is found in the interior.

Should the contemplated World's Fair be held in Chicago, as the directors of the Chicago Horological Institute are said to confidently anticipate, the American system of teaching in watchmaking schools will have an opportunity of being tested in comparison with those of Europe, as it is stated that President Frink has formulated a plan which will result in their making a display of 100 model escapements and movements, the work of students in the school, besides many sketches and drawings.

Rumour again has it that an English syndicate wants the Elgin Watch Company, and has offered 8,000,000 dols. for the plant, says the *Jewellers' Circular*. But if the Aurora Company cannot find a syndicate (English or other) to acquire the assets of that concern, it is rather doubtful if one could be found to go in for the larger affair. Of course, where a good dividend can be shown, as in the Elgin Company's case, as against failure in the other, the public might be induced to speculate.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

18,475. H. Haes and H. Hart, London, for "Improvements in or relating to watch stands." Dated November 19, 1889.

18,561. J. F. Ludwig, a communication from L. W. Ludwig, New Zealand, for "A watch fusee chain rivet extractor." Dated November 20, 1889.

18,639. W. H. Parker, London, for "An improved combination in cases for holding spectacles, eye-glasses, pencils, penholders, and other pocket articles in daily use." Dated November 21, 1889.

18,650. W. Kendon, London, for "Improvements in clocks and watches." Dated November 21, 1889.

18,737. S. Saks, London, for "An improved holder for the magnifying glasses used by watchmakers and others." Dated November 22, 1889.

18,917. L. Inger, London, for "Improvements in combination bracelet and brooch." Dated November 25, 1889.

18,965. T. H. Brinton, London, for "Improvements in the method of securing buttons, brooches, ear-rings, and other useful and ornamental articles of dress." Dated November 26, 1889.

19,552. S. Stanley, London, for "A winding indicator for a timekeeper or any other machine with a going barrel to indicate whether it requires to be wound or not." Dated December 5, 1889.

19,596. H. H. Lake, a communication from The New Haven Clock Co., United States, for "Improvements in clocks." Dated December 5, 1889.

19,608. P. M. Rea, London, for "The manufacture of an improved scarf or necktie pin, the shank of which is fitted with a screw and nut which prevents the pin from being lost or stolen." Dated December 6, 1889.

19,619. P. M. Rea, London, for "An improved scarf or necktie pin." Dated December 6, 1889.

19,696. W. T. Imbrey, London, for "Improvements in the combination of a clock, watch, or timepiece with table, reading, night or other lamps." Dated December 7, 1889.

19,828. H. S. Prentiss, London, for "Improvements in clock movements and the like." (Complete specification.) Dated December 10, 1889.

19,841. E. Elliott, Tunbridge Wells, for "Improved cuff links." Dated December 10, 1889.

19,849. A. Williams, T. Bock, and C. F. Billetger, London, for "Protecting from loss or robbery of valuable scarf pins when in use or worn on the person." Dated December 10, 1889.

19,917. F. Leeming, Halifax, for "Improvements in fasteners or links for cuffs, applicable also as tie-clasps." Dated December 11, 1889.

19,957. J. C. W. Jefferys, London, for "An improved fastening for jewellery and articles of dress." Dated December 12, 1889.

19,964. F. Cowley, London, for "Improvements in sovereign purses." Dated December 12, 1889.

Recent American Patents.

Apparatus for Separating Gold from Pulverized Ore. A. Woodhouse	416,390
Apparatus for Separating Gold from Pulverized Ore. P. del Valle	416,403
Buckle. L. Selling	415,352
Button. J. T. Thornton	415,659
Button Fastener. J. P. Hickey	415,459
Button or Stud. Wm. Loeb	416,470
Cuff Button. Maude P. Woods	415,760
Dustproof Showcase. E. Phillips	415,058
Elastic Chain. Chas. Redwood	416,497
Electric Winding (Clock) Appliance	415,817
Enamelling Metal Surfaces. C. A. W. Vollrath...	415,485
Engraving Machine. T. C. Eberhardt	415,450
Eyeglasses. C. S. Wells	416,528
Jewellery Box. L. Burt	414,751
Lamp Shade. W. S. Berg	415,602
Machine for Enamelling Watch Dials. E. H. Ryan	415,737
Machine for ornamenting Cylindrical Faces. W. M. Patt ...	415,880
Machine for making Coil Wire Springs. Enoch Peterson ...	416,642
Machine for Slotting Screw Heads. C. F. Roper	415,472
Pendant Set Watch. A. E. Keeport...	414,054
Pendulum. G. P. Reed	415,735
Pen or Pencil Holder. J. P. Haislip	413,366
Process of applying Characters and Lines to Dials (Photographic). F. Schmalz	416,015
Rivet made from Sheet Metal. J. L. Thomson	416,694
Rivets, Method of forming Hollow-pointed. H. H. Cummins	414,755 414,682
Secondary Electric Clock. E. L. Slocum	416,148
Shifting Mechanism for Stem Winding and Setting Watches. F. Bourquin	412,457
Spectacle Frame. H. E. Kirstein	412,395
Spectacles or Eyeglasses. J. McPhail	416,486
Stem Winding and Setting Watch. E. H. Flint...	413,654
Stem Winding and Setting Watch. H. Gerber	415,632
Toilet Case. L. B. Martin	413,075
Tool Holder. G. Reyfuss, M. O. Reyfuss, and J. G. Reyfuss ...	414,078
Toy or Puzzle. C. M. Crandall	413,612
Watch Bow. H. T. Buck	415,956
Watch Bow Fastener. H. East and F. L. Turner	412,844
Watch Bow securing device. J. M. Calhoun	415,996
Watch Case. F. Miuk	415,678
Watch Case Pendant. C. L. Hoefer...	413,398
Watch Case Pliers. M. N. Coe	415,960
Watch Case Spring. H. R. Gaul	415,669
Watch Crystal Gauge. O. C. Kraehmer	412,631
Watch Jewel Setting. W. Holden	416,677
Watch Protector. T. Benfield and others	413,644

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

Gazette.

Meetings of Creditors.

Re ALFRED SMITH, jeweller, Westgate, Huddersfield.—A meeting of the creditors of the above was held at the offices of Messrs. Learoyd and Simpson, solicitors, Huddersfield, on the 6th ult., and the statement of affairs prepared by Poppleton and Appleby, at the offices of The Wholesale Traders' Association, Temple Row, Birmingham, showed liabilities, £725 19s., and assets estimated to produce £253 3s. 9d. The debtor was unable to make any offer, and it was evident that he had been struggling for some time to keep his head above water, and it was resolved to wind up the estate at once. With this object the debtor was requested to make an assignment to Mr. George G. Poppleton, C.A., General Manager of The Wholesale Traders' Association, Temple Row, Birmingham, for immediate realization.

Re T. S. Lord, pawnbroker and jeweller, Rotherham.—A meeting of the creditors herein was held at the offices of Webster and Styring, solicitors, Sheffield, on Friday, the 20th ult., and the statement submitted to the meeting showed unsecured liabilities, £4,732 11s. 11d., and the assets consisting of cash in hand, £24 9s., stock-in-trade, fixtures, fittings, &c., £2,037 3s. 6d., furniture, £160 2s., book debts, £8 19s. 6d., making a total of £2,230 14s., which, after deducting preferential claims, £36 4s. 6d., leaves £2,194 9s. 6d. divisible amongst the creditors. It appears a Deed of Assignment had been executed to the largest creditors, and the meeting was called to take into consideration whether the Deed should be adopted or the matter wound up in bankruptcy. The debtor appeared unable to account for the large deficiency which appeared in the statement excepting in a very rough way, and after considerable discussion it was resolved to adjourn the meeting until January 16, in order that an investigation might be made. With this object the meeting appointed Mr. George G. Poppleton, C.A., General Manager of The Wholesale Traders' Association, Birmingham, Mr. Harrison, Manager of the Sheffield Union Banking Co., and Mr. Crowther, Hebden Bridge, to act as such Committee of Investigation.

The Deeds of Arrangement Act, 1887.

LANCASHIRE.

Harrison, Joseph, 5, Nevill Street, and 99, Duke Street, Southport, watchmaker and jeweller. Trustee, Benjamin Ash Roberts, Nevill Chambers, Nevill Street, Southport, accountant. Unsecured Liabilities, £434 18s. 7d. Estimated Net Assets, £330. Deed of Composition dated November 29, 1889; filed December 2, 1889.

MIDDLESEX.

Williams, John (by his attorney), 108, Hatton Garden, wholesale jeweller. Trustee, Lawrence Hasluck, 17, Holborn Viaduct, E.C., C.A. Unsecured Liabilities, £2,908 2s. 10d. Estimated Net Assets, £1,217 1s. 11d. Creditors fully secured, £980 18s. 1d. Deed of Composition dated November 23, 1889; filed November 30, 1889.

Pritchard, W. and R., 66, Hatton Garden, E.C., clock importers (partners, William Richard Pritchard, and Rose Annie Maud Pritchard, spinster, both of The Linders, Enfield, trading as). Trustee, Lawrence Hasluck, 17, Holborn Viaduct, E.C., C.A. Unsecured Liabilities, £2,177 4s. 1d. Estimated Net Assets, £977 6s. 2d. Deed of Composition dated December 11, 1889; filed December 12, 1889.

YORKSHIRE.

Smith, Alfred, Westgate and Bath Buildings, Huddersfield, jeweller and silversmith. Trustee, Charles Thomas Appleby, Birmingham and Huddersfield, C.A. Unsecured Liabilities, £908 7s. 9d. Estimated Net Assets, £379 17s. 6d. Deed of Composition dated December 3, 1889; filed December 9, 1889.

BANKRUPTCY.

Re M. E. GOLDSTEIN.—This case has been already reported in these columns, and the meeting for public examination was held last month before Mr. Registrar Hazlitt. The bankrupt traded as a diamond merchant in Hatton Garden, and he attributed his failure to the loss of a stock of diamonds to the value of £4,000 in a railway journey from Margate to London on the 23rd August last. Mr. F. C. Willis appeared for the bankrupt, and Mr. Howell for the official receiver. The bankrupt was examined as to the loss of the diamonds, and gave particulars relative thereto. He was then travelling, he said, almost daily between London and Margate (his family being at Margate), and he used to carry stock with him, as he endeavoured to combine business with pleasure. He transacted business at the Hall-by-the-Sea. The diamonds were inside a little case which was put into a brown leather handbag. The bag also contained two memorandum books at the time he lost it, and although he offered a reward of £200, and used every endeavour to recover the property, he had been unable to discover any trace of it. His Honour allowed the bankrupt to pass his examination.

Re JAMES MCGRATH the younger, jeweller, of 78, High Holborn.—Under this failure, accounts have been filed showing gross liabilities amounting to £836 19s. 1d., of which £640 4s. 1d. are unsecured, and assets, consisting of bad debts, £140, not estimated to realise anything. The bankrupt states that he has been a dealer in watches, jewellery, and so on, for about 15 years, and has also been employed by his father as an assistant-watchmaker. He attributes his insolvency generally to his household expenses having been in excess of his earnings and profits during several years past, to loss by bad debts, by a fire in September, 1887, to medical expenses through illness of his wife, and to interest on borrowed money. The Official Receiver reports that no books of account have been produced, and the bankrupt has been ordered to file a cash and goods account from January 1 last. The first meeting of creditors is called for the 11th inst.

Re ELIZA JANE POINTON.—His Honour Deemster Drinkwater held a special Court on Saturday to hear a petition in bankruptcy of Eliza Jane Pointon, carrying on business as a watchmaker and jeweller, in Duke Street, Douglas. Mr. Kneen appeared for the petitioner, who sought to be adjudicated a bankrupt on the ground that she could not pay her debts, and also applied for a stay of all judgments under legal process. It was stated that the unsecured liabilities were about £14,000, mortgages and other secured charges, £2,900. The value of the personal estate was said to be £1,200, but the value of the real estate was not mentioned, though it is stated that it has been valued at £3,000. His Honour adjudicated the petitioner a bankrupt, and granted a stay of all proceedings against her.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

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409, George Street, Sydney.

EDITORIAL

No apology is required from us for having given in the present number full prominence to the important proceedings in connection with the opening of the Prescot watch factory on the 11th ult. Having been present at that ceremony, and having noted every salient feature of and about the new concern, we can safely say that the importance of the venture as it is likely to affect the English watch trade in competition with that of the foreigner cannot be over-estimated. How it is likely to result in competition with our home manufacturers is another and an open question which cannot be answered until it is seen the lines upon which the new Company are going to work. Our own impression, however, is that the institution of the factory will act beneficially on the trade as a whole by giving a certain, not small, and heretofore doubting section of the public, confidence in the powers of English manufacturers to produce automatically-machine-made watches of as good a quality and at as small a cost as similar watches can be made abroad.

The unbounded confidence (both of the managers of the new Company and the numerous expectant employees) which marked every step of the opening proceedings, was a good omen of success; and as those having invested their moneys in the Company display (see the speeches of Lord Derby, and Messrs. Pilkington and Forwood) an equal amount of certainty as to the future of the concern, it may be said that the affair is now launched with every prospect of successfully overcoming the well-known difficulties (financial and otherwise) which usually beset such enterprises in their initial stages. We trust nothing serious of the kind referred to will occur to mar the prospects of the undertaking, which just now appear to be sufficiently rosy to warrant the continued confidence of its promoters and supporters. Should the former be able to show as good an outlook at the end of the year as they have done at the beginning, want of funds will not be the reason for not going on with and extending the field of operations, and it is quite on the carpet that it will not be long before the other contemplated factories are built on the reserve land acquired adjoining the first building, and the full complement of 3,000 workers employed.

If the predictions of the sanguine Prescotians be verified (and we see no reason why they should not) the Lancashire Watch Factory will be only the forerunner of many other similar institutions in this country, and its installation will have marked an important epoch in the trade.

GENERAL NOTES

REMARKABLE PRICE FOR OLD SILVER.—Messrs. Geo. Gouldsmith, Son, and Co., of Pont Street, S.W., sold by auction last month, at 72, Prince's Gate, a set of three very curious chased and embossed silver gilt vases and covers, date 1611, and weighing about 80oz. After an exciting competition the lot was knocked down for £1,000, being at the rate of about £12 10s. per oz.

THE LARGEST DIAMOND.—Andrews S. Kerby says to the editor of the *Birmingham Daily Post*, writing from Dutoitspan Diamond Fields, South Africa, under date December 7, "I notice, in your answers to correspondents of October 26th, you say that 'the largest diamond certainly known belongs to the Rajah of Mattan, and weighs 367 carats.' I do not know if you are aware that the famous 'De Beers diamond' in its rough state weighed 428½ carats, and I believe was exhibited at the Paris Exhibition this year.

DEATH OF A LIVERPOOL OPTICIAN.—The death took place on the 8th ult. of Mr. Charles Henry Chadburn, who expired at his residence, Haddon Villa, Egremont. The deceased gentleman, who was in his seventy-fifth year, was connected with the locally well-known firm of Messrs. Chadburn and Sons, patentees and manufacturers of ship telegraphs, opticians, etc., 11, Waterloo Road, and 17, James Street, Liverpool. He had a very large circle of friends, especially in Egremont and Wallasley, and his death will be greatly lamented by them. He was also highly esteemed by everybody with whom he came in contact while conducting his business. The remains of the deceased gentleman were interred in Wallasley churchyard.

A NOVEL CLOCK.—There is something weird and uncanny, which will exactly suit the provincial Russian, says a lay contemporary, in the form of the monument which the Kharkoff clergy have chosen to erect in their town in commemoration of the Borki accident. The monument consists of a massive silver clock, the face of which is turned in the direction where the accident happened. Once a year only, at the exact moment when the Czar and his family escaped being killed in the railway disaster, a heavy silver bell strikes solemnly for five minutes, after which the clock is silent for another twelvemonth. If some Russian mushitchook does not run away with it before the first anniversary of the accident, the silver bell will soon be heard for the first time.

A NEW ELECTRIC CLOCK.—An American electrician is said to have just patented something as new as it is unique in the way of a clock. Aside from being a regular timepiece and daily calendar, it is also provided with a system of keys making a double circuit around the outside of the clock, the first one to denote the hour and minute, and the other the day of the month. The object is to furnish thereby a regulator for business appointments. For instance, if a man had an appointment at 9.10 o'clock one morning, he would turn the indicator to that time, as well as another to December 1. At the minute exactly that morning an alarm would be turned in, and would continue to ring until stopped. The clock is the first of its kind in America, and has been viewed with considerable interest by the jewellery trade.

ROUMANIAN TRADE IN WATCHES, &c.—*The Citizen* learns from Bucharest that Roumanian trade during 1889 has been fairly satisfactory in watches and clocks, although it suffered somewhat in the summer from the Paris Exhibition, to which a very large proportion of the wealthier classes went, and bought watches and jewellery in the French capital, instead of placing their orders at home. On the whole, however, thanks partly to the good harvest of 1888, there was a distinct improvement, and failures were less frequent. The greater part of the watches imported come from Switzerland, but only a very small proportion are gold. For this the high duty of 12s. 6d. per article, representing a tax of 15 per cent. on the average value, is largely responsible, and the advisability of lowering this rate, in the interest both of the revenue and of the consumer, is being urged. Nearly half the foreign clocks come from Germany.

THE REPORTED ENGLISH SYNDICATE AND THE ELGIN WATCH COMPANY.—The latest reported doings of the ubiquitous and indefinite "English Syndicate," says a contemporary, whose emissaries seem to be prowling about every established American industry with tempting offers of purchase, is that it is negotiating with the celebrated Elgin Watch Company for the sale of its plant, near Chicago. It is said that 8,000,000 dols. has been offered to the company for the whole concern. The directors decline this offer; but is understood that, without giving any positive assurance, they might be willing to consider another of 12,000,000 dols. Such a figure is probably high enough to "give pause" to the most sanguine of syndicates. The plant of the company at Elgin is on an enormous scale, employing upwards of 28,000 operatives, and turning out 1,700 watch movements a day. The annual income of the company is over 3,000,000 dols. The English agent who is looking after the Elgin plant has telegraphed the company's decision to his London principals, and is waiting for further instructions.

DUNDEE WATCHMAKERS' AND JEWELLERS' FESTIVAL.—On the 22nd ulto. the watchmakers and jewellers of Dundee held their annual festival in the City Assembly Rooms. There was a large attendance, and after an excellent tea had been partaken of, Mr. James Whytock, who occupied the chair, said he had to thank them for the honour they had done him. It was 25 years since he entered the trade, and some of the younger members would be astonished when he told them that he had then to work from eight o'clock in the morning until eight at night. On Saturday he worked only six hours, but he had to make up for this by working during meal hours and after eight o'clock at night during the rest of the week, so that before the Factory Act came into operation a jeweller's lot was not a very happy one. He thought they should form themselves into a Committee, so that they might have a representative sent to the Trades Council. They should combine and see that they got their rights. (Applause.) An excellent programme of songs, recitations, &c., was afterwards gone through, and a very pleasent evening was spent.

FASHIONABLE JEWELLERY.—The rage for moonstone and diamond *bijouterie* still continues, and the demand brings forth new designs constantly. A special one for this season is a sprig of mistletoe in small brilliants, with two berries of moonstones. This is for a pin or brooch. One heart surrounded by diamonds, or two connected by a true lover's knot, in the same; a Welsh harp, a mermaid, with the head and body of moonstone, beautifully carved, and the tail of small diamonds; a bat with outstretched wings, and many other devices, are popular just now. A fashionable present to a gentleman is a pin, with a circular moonstone about the size of a pea, surrounded by diamonds; a set of sleeve links or studs in the same style. There is a mysterious savour of good luck about them, which enhances their interest. Diamond jewellery appears to be considerably increasing in size, to judge by the newest specimens, for a crescent, measuring quite five inches, a star as much in diameter; a swallow even more, from beak to tip of tail; a flight of good-sized swallows are the fashionable ornaments of the day, to say nothing of a long trident, with diamond bead, to run through the hair; another pin, with a cluster of diamond hair-bells, of alarming length, or a large brilliant scimitar or sickle, for passing through the hair or fastening in flowers. Among the revivals, according to the *Queen*, is the bow and ends of diamonds, so popular about 50 years ago.

Presentation to Lady Loch.—One of the last ceremonies in which Lord and Lady Loch took part previous to their retirement from Melbourne was the presentation on the 13th of November to her ladyship of a magnificent set of diamonds subscribed for by the ladies of Victoria. £1,600 was raised, and after some discussion it was decided to purchase the gems in Paris. Accordingly Lady Lytton, Lady Loch's sister, was asked to undertake the purchase, and the result reflects great credit upon her ladyship's taste and judgment. The ornaments consist of a tiara of three bows, of a necklace similar to one worn by the ill-fated Marie Antoinette, and now in the possession of the Comtesse de Paris, and of a pair of ear-rings of magnificent single stones. These were purchased at the establishment of M. Baphst, and sent out to Sir Benjamin Benjamin, the Mayor of Melbourne, and Chairman of the Presentation Committee. But here a curious incident occurred. There is a heavy duty on diamonds imported into Victoria, and, in order to save any trouble with the Custom House, they were sent in an official despatch-box, which, as the gems were going out of the colony almost as soon as they went in, seems a perfectly fair proceeding. However, the Opposition got wind of the incident, and merely to annoy the Government, without any idea of disrespect to Lady Loch, made such a fuss that, before the presentation could be made, Sir Benjamin had to become responsible for the whole duty, some £200. No further *contretemps* took place, and the presentation was duly made.

Robbery from Messrs. Backes and Strauss.—At the Guildhall, before Mr. Alderman Tyler, Charles William Moulden, 18, living at Lotts Road, Chelsea, a clerk in the service of Messrs. Backes and Strauss, manufacturing jewellers, Holborn Viaduct, was charged on remand with stealing a cheque for £15 and forging an endorsement to the same. Mr. Styer (solicitor) said the prisoner had been in the service of Messrs. Backes and Strauss for two years. It was part of prisoner's duty to attend to the stamp business. There were many persons employed, and therefore it was absolutely necessary to take these proceedings. If, however, a certain course were taken by the accused the prosecutors would withdraw the charge of forgery and only proceed with that of stealing £6 worth of stamps. The prisoner had obtained some goods and had illegitimately pawned them. Mr. Rentoul (barrister) said the accused would plead guilty to stealing the stamps. He asked that he might be leniently dealt with, as he was most respectably connected and had unfortunately got himself associated with a company of gamblers. The greatest care would be exercised towards him when he came out of prison. The charge of forgery was then withdrawn, and formal evidence was given with regard to the theft of stamps. The defalcations amounted to £140 worth of stamps and between £10 and £20 worth of goods. The Alderman sentenced the prisoner to be imprisoned for a term of four months with hard labour. The goods pledged by the prisoner were given up by the pawnbrokers.

A "Wrong Un."—George Augustus Luckhardt, aged 18, was charged on remand at Marylebone, last month, with stealing a hall clock, valued at £4, the property of Miss Dora Burley, living at 6, Melbury Terrace, Dorset Square; also with stealing a gold brooch and a gold watch and chain, value £6 10s., the property of Miss Hodgson, of Balcombe Street. It was shown that the prisoner's father was a jeweller and watchmaker, living in Boston Street. Miss Burley had the clock repaired by the prisoner's father recently, and after he had returned it the prisoner called and got it away under the pretence that his father had by mistake put a wrong part into the case. The clock was afterwards pledged for 27s. Miss Hodgson purchased a gold brooch at Mr. Luckhardt's, and some time afterwards the prisoner called and asked the loan of the brooch, as his father had an order from a lady to make one like it. She let him have it, and when about to leave the front door he pretended that he had dropped a paper in the sitting room, and went back to find it. After he had gone she missed her watch and chain, which had been on the mantelshelf. The jewellery was afterwards found pledged at different pawnbrokers. Detective Webb, of the D division, said that since the prisoner was first before the Court the father's business had suffered severely as the result of his son's misconduct, and the matter had so preyed upon his mind that last Thursday he attempted to poison himself, and he was now a patient in St. Bartholomew's Hospital. The prisoner had admitted the thefts and had given information as to where he pawned the property. The witness was present at the Sessions in October of 1888 when the prisoner was sentenced to nine months' imprisonment, after a previous conviction, for housebreaking. Mr. Cooke committed the prisoner for trial.

Parisian Jewellery Swindlers.—A gang of clever swindlers, said to be English, have during the past few weeks been striking terror into the hearts of Parisian jewellers. This gang is all the more dangerous from the fact that they disdain the clumsy methods of ordinary burglars. Relying rather on their gentlemanly appearance, expert knowledge of the values of precious stones, and rare dexterity of fingers, which enables them to substitute one article for another right under the owner's nose, they commence operations by strolling carelessly along a promising street in Paris, and stopping now and then before a shop window where valuable stones are displayed. Apparently there is no harm in this, but in reality the sharp-eyed rascals are committing to memory every detail of the setting in some piece of jewellery which strikes their fancy. This being accomplished, an imitation of the covetted treasure is made so accurately that even an expert might be deceived for the moment. But a moment's deception is all that is necessary. Provided with false ring or bracelet, a conjuring confederate, elegantly dressed, calls at the shop, commences pricing various articles of value, and finally comes to the particular one of which he has a duplicate in his pocket. Then while admiring the brilliancy of the gem or arguing about the price, a change is somehow made—just how or when the jeweller never knows. What he does know, however, is that shortly after the glib-tongued customer has left the premises, promising to "drop in next day," the unsuspicious salesman discovers that he has been grossly swindled. Needless to say the elegant Englishman never "drops in" again. A well-known jeweller on the Rue de la Paix has just been victimised in this way. Explaining what happened to the Commissaire de Police, he said, "The strangest thing about it is that I distrusted the fellow all the time, and was convinced he had come to rob me. Yet he managed to rob me all the same. I waited on him personally, and my assistants stood beside me watching every movement the man made. It was no use; he went off with a diamond ring worth 2,000 francs, leaving in its place a worthless trinket in paste and brass." Another jeweller has lost over 7,000 francs worth of jewels in a similar manner.

Rating of Watches at Kew Observatory.—The report of the Kew Committee of the Royal Society states that during the year ending Oct. 31, 1889, 528 entries of watches for rating were made. They were sent for testing in the following classes:—For class A, 483; class B, 28; and class C, 17. Of these 119 failed to gain any award; 15 passed with C, 28 with B, 366 with A certificates, and 21 of the latter obtained the highest, class A *especially good*. An Appendix gives statements of the results of trial of the 26 watches which obtained the highest numbers of marks during the year, the highest position being attained for the third time by Mr. E. F. Ashley. His watch was a keyless single roller fuzee, which obtained

89·1 marks out of a possible 100. He is very closely followed by Mr. A. E. Fridlander, of Coventry, whose keyless double roller fuzee stands only one-tenth of a mark lower on the list, having gained 89·0 marks. It is satisfactory, continues the report, to note the general improvement in the performance of the watches sent to the Observatory, the proportion of failures of those submitted for trial being but 22 per cent. against 34 per cent. last year. The effect is, moreover, seen in a diminution of the number of entries, for makers are more critical as to the performance of their watches during the timing and springing operations than they were before Kew trials were instituted. No difficulty has been experienced in maintaining the three safes—in which the watches are placed during rating—at the three temperatures of 40°, 65°, and 90° Fahr. respectively, all the year round. Special attention continues to be given, as before, to the examination of *pocket chronographs*, in accordance with the request of the Cyclists' Union, and the extra tests alluded to in last Report have been regularly enforced. *Marine Chronometers.*—Certificates of mean daily rate and of variations of rate at three different temperatures have been awarded to 10 marine chronometers after undergoing the 35 days' trial as specified in the regulations.

The Diamond Market.

The high prices quoted for rough stones have kept the London market extremely quiet during the past month. The state of affairs may be shortly summarized as :—Small consignments, high quotations, few buyers, and little demand on account of the two latter causes.

Little can be said, according to *De Diamant*, of the Amsterdam market ; few polishers are working, and the stuff in hand is sold with difficulty owing to the existing prices.

The Paris trade is in a little better state than since our last report, but nothing is being done worth mentioning. The *La Normandie* had only four packages on board on her last voyage consigned to New York dealers.

In connexion with the higher quotations now ruling it may be mentioned that many of the dealers here doing a foreign trade are closing up their agencies abroad. One large merchant gave it as his opinion, the other day, that it will take fully two years for foreigners in some parts of the world, notably in South America, to realise and become reconciled to the present quotations as being normal.

TRADE NOTES

Presentation to a Bradford Schoolmaster.—Last month there was a gathering of the old scholars of St. Paul's Day Schools, Manningham, in the schools, Ambler Street, for the purpose of presenting Mr. James Bradley Johnson, the head master, with an illuminated address, a marble timepiece, and a pair of equestrian bronzes, on the completion of the thirtieth year of his service. The clock was of the finest black marble, richly engraved with gold scrolls, etc., the top being supported with six massive real bronze pillars, the capitals of which were artistically chased and richly gilded. The figures were a pair of finely-chiselled solid bronze marley horses. These, as well as the clock, were selected from the stock of Messrs. Fattorini and Sons, Bradford, who are so often called upon to supply these public presentations. The address was by Mr. Lister, Market Street, Bradford.

The Electro Platers' Grievance.—The electro-platers of Birmingham and Sheffield who waited on Sir Michael Hicks Beach last month to ventilate their grievance against the railway companies under the operations of the Carriers Act, need not be disheartened, says *Contemporary*, because the President of the Board of Trade did not see his way personally to take up the matter. So far as the necessary official caution could go Sir Michael pretty well admitted that the deputation had made out its case respecting the railway charges on electro-plate. But he does not wish to deal with the matter piecemeal ; what was true of goods of that description was, he observed, probably equally true of others which had of late years increased in bulk and decreased in value. His suggestion of a Parliamentary inquiry on the whole subject is therefore the best way to remedy the grievance. It is certainly not fair that the railway companies should continue charging the high rate they do for electro-plate goods, a rate based on a value that is now quite obsolete. They are thereby really throwing on their customers, the traders, all the responsibility, which as carriers they should reasonably accept themselves, and it is asserted that in consequence of this, goods in transit are not so carefully handled as they would otherwise be.

The late Mr. Robert Free, whose death took place in the latter part of November, possessed an extensive knowledge of the old fashioned bankruptcy system. His experience, says the *Birmingham Times*, in the old bankruptcy court in London was full of incident, and some amusing stories were told by the deceased gentleman. It was the custom in those days for the bankrupt on surrendering to deliver all the property he had about him, such as money, watches, jewellery, and other articles. In one of the cases in which Mr. Free was concerned the bankrupt handed to the commissioner his property, including the watch, which, as was usually the custom, was returned to him. After the proceedings were over the bankrupt made hasty tracks to the well-known tavern in the vicinity where, taking out his watch, he produced a number of bank notes, and exultingly exclaimed, "How kind the Court has been, they have given me back my watch and £50 besides." The cunning old rascal, anticipating that the watch would be returned to him, had placed the notes inside his watch case, and as no one thought of looking inside his watch for concealed property, he had succeeded in his trick. Subsequently, however, the rogue was apprehended and sent to prison for obtaining money by false pretences.

BIRMINGHAM NEWS

From Our Correspondent.

Although the last month has not been conspicuous for any great rush of business among our manufacturers, there is every proof that it was only the cessation consequent upon the passing of the holidays ; travellers had not yet got fairly upon the road again. Scotland, to whom a good quantity of our home orders go, does not commence festivities until ours are about ended, so it is no use expecting anything very great from that quarter during January, or the early part of it at any rate ; in addition to which all orders received during December were got through before Christmas, where it was at all possible, so that order books were ready for fresh indents, which are always rather scarce until the holidays are well over. By the end of the month, however, spirits had risen again to a cheerful temperature, and full swing was the order of the day. The month has been rather a dull one in the matter of news, very little alterations or new ventures having come to light ; a little talk has been occasioned in the watch trade by the announcements in the press of the starting of the Prescot Watch factory, and the enquiry, where will they get their men from, has been of frequent occurrence, the trade here have during the last two months increased the wages of some of their hands, so that they do not anticipate losing any of them on the plea of poor wages, and the probability is, a further advance will take place in some branches. At a dinner given to the employees of the English Watch Company, by the directors on December 18, the Chairman of the Company, Mr. H. Griffiths, jun., welcomed the employees in the name of the Directors, and repeated a hope that with the advent of better times, which he believed had now fairly set in, the Board would ultimately see their way to award something in the way of a bonus to each of the men in their employ; this and other similar signs look like brighter times for a trade that has, I suppose, suffered more from depression than any branch of the Jewellery or kindred trades.

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A change has just taken place in the firm of G. E. Walton & Co., Hylton Street, Mr. A. G. Walton having retired from active participation in the concern; he will I understand, still have a considerable monetary interest in the business. This is the last retiring member of the Walton family, who have been actively engaged in the trade for two generations.

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Owing to increase of business Mr. Chas. E. Solomon has removed from 56, Hylton Street, to much larger and more convenient premises at 14, Hylton Street.

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The second Annual Meeting of the members of the Birmingham Jewellers and Silversmiths' Association was held on Monday, January 27, 1890. The annual dinner of the Association will be held early in February.

SHEFFIELD
NOTES

From Our Correspondent.

A circular issued by Messrs. Round and Son (Limited), announces a reduction of discounts, ranging from 2½ to 5 per cent., according to the class of goods. This of course is equivalent to an advance in values, and is an unavoidable result of the general state of prosperity which prevails. The continued rise in the price of fuel, and of the different metals used by manufacturers of electro-plate has rendered this step inevitable sooner or later. These reductions are general throughout the silver and electro-plate trade, although not uniform in every establishment. Articles of which ivory forms a part, are dealt with in a special manner, being subject to such revision as the fluctuations of the market may from time to time render necessary.

The continued rise in the price of fuel is also considerably affecting the large class of "little mesters" which exists here. Wheel rents are going up in sympathy with the price of coal, and although the hirers of power may admit the justice of this course, it bears none the less hardly upon some of them on that account.

The supply of ivory for the January sales is again far short of the requirements of the Sheffield trades. The recent unsettled state of the markets has rendered the lot of a Sheffield ivory cutter far from being a happy one. The loss on ivory cutting has been in point of fact very considerable, even when the extra prices recently obtained have been taken into account. Those silversmiths and cutters who do not cut their own ivory have certainly at present a considerable advantage over those who do.

Notwithstanding an almost glut of orders, it was well on in the second week in January before the majority of works commenced business. The reason of this, to those who know Sheffield, is not far to seek. In the first place, the average Sheffield, artizan cannot get along without his week's holiday at Christmas; and as Christmas day only occasionally coincides with the beginning or end of a week, a few days has mostly to be added to round off the second week. With the object of filling up this gap, manufacturers take stock, whitewash workshops, and repair machinery, which generally spins out the holiday for a few days longer. This arrangement of course does not please everybody, and there are those who would prefer that this enforced holiday took place at Midsummer, when voices from the sea are calling to them from flaming posters on every blank wall. Nevertheless there is some compensation for this state of things this year. Never did the New Year open with better prospects. As far as can be seen ahead, a period of good trade seems assured. Some artizans in the silver trade—to wit, the spoon and fork filers, are evidently taking advantage of this, to form an organization which has just been federated with the Associated Trades of the town.

A very representative meeting, convened by the Master Cutlers, has just been held in the Cutlers' Hall, to consider the advisability of urging the Government to further efforts to suppress all false indications of origin abroad. The Cutlers' Company, the Corporation, the Chamber of Commerce, and the Federated Trades were all officially represented, and it was ultimately resolved to ask Lord Salisbury to receive a deputation of representatives from the four bodies above named on the subject—the Right Hon. A. J. Mundella and Mr. C. B. Stuart Wortley being requested to see his Lordship on the matter at the earliest opportunity.

Her Majesty's Inspector of Factories has usually a busy time of it at this season. The prosecutions relating to infringements of the law as to the employment of women and children during Bull week, come on in January. This year I find no Silversmiths in the black list, but one firm in an auxiliary trade has been made to smart pretty severely. Messrs. Dewsnap and Co., cabinet case makers—a trade at which women are largely employed—were summoned for allowing women to work after two o'clock on the Saturday before Christmas. The defendants were convicted, and the fines inflicted amounted to £5 12s. Now it has been the custom in Sheffield from time immemorial, to consider Christmas Eve as Saturday, and to treat the previous Saturday as an ordinary working day. No hardship is involved in this arrangement, employees being only too glad to fall in with it. Now, however that it has been proved to be illegal, as far as women and children are concerned, these two classes will henceforth have to be dispensed with, although the custom will still continue to be practised.

Mr. Lockwood and Mr. Belk, president and vice-president respectively of the Sheffield Chambers of Commerce, have not yet succeeded in convincing Sir Michael Hicks Beach that the electro-plate manufacturers of the town have much reason to complain of the operation of the Carriers' Act of 1830. The President of the Board of Trade would probably not go so far as the Apostle Peter, who when told that a certain applicant for admission into Paradise came from Sheffield, replied that he had never heard of such a place. He did however inform the deputation from the Associated Chambers of Commerce that although ha had heard that Silk Manufacturers were dissatisfied with the Act, it was news to him that its incidence was felt in any way by electro-plate manufacturers. Now, considering the proportions to which the electro-plate trade of the town has attained, this must either be the fault of Sir Michael or the manufacturers. Anyhow the President of the Board of Trade deserves great credit for not desiring to do anything in a hurry. It is not quite clear from the newspaper reports of the interview, whether this assertion that he "did not think the matter was ripe for legislation until they had more fully inquired into it" applied to the Chambers of Commerce or the Board of Trade. From the reply of a member of the deputation (not from Sheffield) that the Associated Chambers would take Sir Michael's suggestion into consideration, it is presumed that the former was meant. The idea, however, of Mr. Belk, an ex-master Cutler, and an electro-plate manufacturer of some standing, making "further inquiries" of the firm of Roberts and Belk, is not easily conceived of.

The old plating process was an exceedingly expensive one—some of the articles made under it being only a little less dear than if they had been made of sterling silver. The discovery of the process of electro-plating, while it immensely increased the volume of trade, greatly cheapened the cost of individual articles. The old rules, however, regulating the liability of Railway Companies and the conditions of insurances are the same now as they were then, and under the altered conditions, are felt to be not only irksome but positively injurious to the interests of the trade. What manufacturers are aiming at is an amendment of the law, which will make it harmonize with the changed circumstances of the trade.

The unexpected failure of Messrs. Bissett & Sons, contractors, threatened at one time to postpone indefinitely the completion of an important range of buildings of which the foundations had been got out in one of the numerous vacant pieces of land near the centre of the town. The recent re-appearance, however, of bricklayers and masons on the "job" shows that the contract has again been let, so that in less than a year we may expect to see brilliantly lit shops on what has been for years little better than a howling wilderness. In spite of good trade these plots of land move off but slowly. One speculator seems to wait until the other has finished his block and then proceeds in a leisurely manner to begin his own. There thus seems to have been going on for years a perpetual getting out of foundations, with all its attendant misery of clay-littered streets. Moreover, the Highway Committee have vouchsafed to them a glorious opportunity of doing nothing, of which they avail themselves with avidity. They have evidently satisfied themselves that it is no use repairing streets where all this racket is going on, and likely to got on for year so come.

We are at last within "measureable distance" of possessing a new Town Hall, or, as the promoters of it, for some inscrutable reason, prefer to call it, the Municipal Buildings. An open competition has resulted in a large number of plans being sent in, and from these six sets of designs have been selected from which to make the final choice. When this is done and the buildings erected the centre of the town will be moved to the verge of the aforesaid wilderness. This, in conjunction with good trade, will naturally have the effect of causing the remaining lots to be quickly taken up. This is a consummation devoutly to be wished, as the unfinished state of the town's improvements has for years practically cut the business part of the town in two.

The last people in Sheffield to feel the effects of a revival in trade are the retail shopkeepers. This is especially the case with jewellers, who necessarily deal in luxuries. It is satisfactory to learn, therefore, that this much tried class has at last been reached. The manager of a well-known jeweller and watchmaker, less reticent than his principal, told me the other day that the last six months have been by far the most prosperous they have experienced for over ten years. I have reason to believe that this is not an isolated case.

The friends of Col. Bingham will be glad to learn that he has almost quite recovered from the results of the alarming accident chronicled in these notes last month. Apart from personal considerations, men like him can ill be spared in a community like this. It would be an inappropriate metaphor to say that Mr. Bingham had made two blades of grass grow where only one grew before, but as a matter of sober fact he has been the means of enabling three silversmiths to earn a living where only one did before. Mr. Bingham is the apostle of what is called "Fair Trade," but we can overlook that in view of the solid work he has done in extending the trade of the town.

The Lancashire Watch Company.

OPENING OF THE NEW FACTORY.

THE contract for the erection of the new factory was entrusted to Messrs. E. Taylor and Co., Littleborough, near Bolton, who have completed the work to the satisfaction of the directors. The new factory, including the yard, occupies a site 286 feet long by 89½ feet wide, and consists of one-storey buildings, except where cellared for the heating and ventilating arrangements. The principal workrooom is 180 feet long from north to south, by 87 feet wide. The main entrance to the room is in the centre of the south wall, and ranged along this wall are six foremen's cabins formed of glazed partitions, and each commanding a view of the whole room, and more particularly of the two ranges of benches immediately in front of it. The west wall is the permanent boundary of the factory, but the east wall is intended to be temporary, the roof being carried by iron columns to provide for the extension of the factory in that direction. On the west of the passage, at the entrance to the works, are placed the offices, consisting of general office, 22ft. by 13ft. 9in.; despatch office, 18ft. 2in. by 12ft. 6in.; board room, 20ft. 7in. by 13ft. 9in.; and manager's office. And between the offices and principal workroom is an oil store, and a a room 40ft. 6in. by 38ft. for machine making and for storerooms for materials. On the east of the main entrance passage is a dining-room and women's cloak-room, 32½ft. by 16½ft., a cooking-room, a washhouse, and a room for heating apparatus, and between these and the principal work-room the engine-house and rope race for the motive power machinery. The provision for the warming and ventilation of the factory is of a perfect character, and is such that the air may be completely renewed every fifteen minutes. A complete system of piping has also been fitted up for automatically conveying oil to all the machines throughout the premises. The latest inventions in machinery have been placed on the premises, and also machines for tool-making. The buildings have been arranged so as to leave space for three additional factories of the same size alongside, on land belonging to the company, and a four-storey building of ornamental character along the principal front, the whole providing accommodation for some 3,000 workers.

Opening Speech of Mr. T. P. Hewitt.

Mr. T. P. Hewitt, who was received with cheers, said: My Lord Derby, ladies, and gentlemen, before inviting his lordship to address you, I think it would be as well if I gave you a short *resumé* of this undertaking we are met to celebrate this day. For the ten years succeeding the year 1887 the watch trade in this district had been steadily declining, in fact, it was well nigh extinguished. The causes of this were well known to all practical men, but the difficulties in the way of reform were more easily conceived than overcome. We not only suffered in common with the general depression of trade throughout the country, but we suffered from causes which were unique, and which were more fatal to our district, and which were sure to remain after the general stagnation had passed away. I allude to the advances made by our foreign competitors over the water, who by the introduction of large joint stock enterprises, had been enabled to equip themselves with powerful combinations of machinery, which we with our scattered and detached systems and partial machinery and hand work could not possibly compete against, particularly in the cheaper classes of watches; although, in some cases, wages were almost reduced to the level of sweating and starvation. We also suffered from another cause, the alacrity with which unscrupulous manufacturers of watches adopted our trade marks and designs, and put their cheap products into our English hall-marked cases, and sold them as of British manufacture. Well now, ladies and gentlemen, it was high time something was done to alter this state of affairs. It was not supposed that we were going to surrender our trade without an effort, and I am pleased to say we were surrounded by gentlemen, who are on this platform, who did something to assist us in the Merchandise Marks Bill. I am pleased to say the Government of this country recognised that we were being unfairly treated in this matter, and did all they could to put a stop to it. Lord Stanley of Preston, now Governor-General of Canada, who was then President of the Board of Trade, was one of the first to assist us. He introduced in the Merchandise Marks Bill clauses for our special protection, and thus one of our principal difficulties was effectually overcome. But, ladies and gentlemen, cur greatest effort had yet to be made. It was evident to all practical business men that the inexorable law of commerce must be complied with, and that we must make our watches as cheaply as any of our competitors, or else abandon the field and leave it entirely to them. Well, some of us talked together, and we suggested the necessity of combination, so that we might supply ourselves with the requisite machinery and appliances for watchmaking in this district. A joint stock company was suggested, but, as usual with all new departures, we met with various objections and some hostile criticism. Some people told us we were 20 years too late, others said we might possibly succeed, but it would only benefit a few at the expense of the many. Well, now, I believe we succeeded in establishing the truth of the situation in the minds of thinking men, and I am an ardent believer that truth will always prevail over untruth and hearsay, although one is apt to get impatient at the process. We did succeed finally in establishing the situation, we kept making one convert after another until now we stand in this building to day, which is the first section of the Lancashire Watch Company's premises. This company has been in active operation for the last twelve months, and I am prepared to say without fear of contradiction in shortly summing up the results of these operations that we have succeeded in making trade better in this town. We have found continuous work for the workpeople; we have paid a higher price for their work than has hitherto been paid; and we have also secured a fair return on the capital we have employed; and we have built up this place, which opens the way to extended operation and increased trade; and we have even benefitted our local opponents in the bargain, from whom we expect no thanks. Thus we enter into the field to-day with a greater field of operations before us. I do not mean to say, or think, that we have passed by all our difficulties, but I will say this, that the energy you have displayed in carrying forward this movement will be a force and a factor in your future development, although the watchmaking of the future must necessarily be different to the watchmaking of the past, which was mere handicraftship. If we apply ourselves with great determination we shall be able to conquer all the problems of the future, as we have in the past. We must set to work to establish in Prescot schools of instruction, where we can be taught theory as well as the practical process. If this can be done, and you are paid wages commensurate with the work you are called on to do, so that a proper love and enthusiasm may be fostered, then, ladies and gentlemen, I have no hesitation in announcing the faith that is in me, not even before Lord Derby and this distinguished company, that in a few years hence you will have the pleasing satisfaction of looking back and knowing and feeling you were the men that at this critical juncture of your trade's history stood in the breach, and held your trade from annihilation, and handed on your ancient industry, not impaired, but resuscitated and revivified, so that the next and succeeding generations shall be enabled to further cultivate and extend it, until the name of Prescot will become a synonym for watches and clocks throughout the whole world. I have the greatest possible pleasure and delight to invite his lordship to address you.

Lord Derby, who was enthusiastically received said: Ladies and gentlemen, I am heartily glad to meet you, and I am glad, moreover, to see so much interest excited in Prescot by the attempted revival—I will leave that qualifying epithet alone—by the revival of an ancient local industry. It is a saying of the wisdom of old time that a man who has only put on his armour should not brag, as he might naturally and excusably do when he took it off, after a day of successful fighting. I do not know that bragging under any circumstances is desirable or commendable, but if it is ever to be indulged in it should be when you can point to something that has been done to justify it, not on the strength of an undertaking which is still in its earliest stage. Now, this new company is only starting, and all we can do or claim for it as yet is that it has made

A GOOD START.

That is something, for if the proverbial wisdom be true half of our work is done, for it is certain we have begun well. You all know the circumstances under which it was projected. You know that Prescot 100 years ago, or even 50 years ago, held a position of much greater relative importance than it does now. I do not suppose that it has actually lost in population, although its wealth may have diminished, but other towns have increased and we here have remained stationary, even if we have not actually gone back. Several sources of income which Prescot used to enjoy have been, one by one, cut off. In the old posting times, which some of us can remember—I am sorry to say I am one—Prescot was the last stage into Liverpool, and there was a large amount of traffic necessarily passing through it. When the railway came, it left Prescot high and dry, left out in the cold as the modern phrase goes, perched on its hill where no business came near it. Then again, it was formerly a frequent and favourite residence of people who had business in the adjoining district. In that respect with regard to residential attractions it has suffered in various ways—partly from the opening of collieries all round—partly from the influences of its big and not fragrant neighbours, St. Helens, Runcorn, and Widnes—partly, and perhaps principally, from the increased facilities of locomotion in the present day, making it not only possible but easy for many who have business here, to find their way to more picturesque and more attractive districts. Well, then came what Mr. Hewitt has spoken of, the gradual decadence and decay of the watch trade. We had it here. We have it within recent memory, and why or how we came to lose it, I have never quite understood, but lose it we did. There is no question about that. Some part of it, I am told, went to Birmingham, the greater part, probably, went abroad, and as a consequence, want of employment, poverty and distress have been severely felt here. Well, that was the state for which some remedy had to be found. Proverbially it is no use crying over spilt milk, and there was no gathering up this spilt milk; there was only one thing to do, and that was to invest in a cow, and go in for a fresh supply. The idea of reviving our perishing industry by setting up a public company was first announced about two or three years ago, and in the first instance it was understood that the company should be on a large scale. Circumstances occurred to make that scheme impossible, or at any rate to make it seem too large to make it safely attempted at the time; and we have begun in a smaller way, wishing to feel our road, and leave it open to ourselves to extend our operations after. Of the practical working of the concern Mr. Hewitt has told you, but he could tell you a good deal more. The reasons we think it ought to be a success are briefly and easily stated. We saw what the Americans had done, and we could not see any reason why we in Prescot should not do the same. Capital is cheaper here than on the other side of the Atlantic; that is to say, people are ready to invest it with a prospect of a readier and smaller return. Labour also is cheaper here than it is likely to be in the new country, and in a country where very high taxation and high protective duties have swelled the cost of almost every article to an enormous amount, and as for industry, invention, and ingenuity, these are qualities which have never yet been deficient in Lancashire, or here in Prescot. Then again, things are made easier for us because we have only really to copy, though we hope it will be a copy with some improvement upon what has been done elsewhere. I think we may claim that our success—I will not say when we succeed—will be more than a private or merely local advantage. We

DON'T WANT TO FIGHT THE FOREIGNER

with unfair weapons, we don't want to take a cowardly shelter behind prohibitory or protective tariffs, but if on fair and equal terms we can produce at home what is now brought from abroad everyone here will be advantaged, and no one else will have fair reason to complain. Now there is one circumstance in connection with this business which seems to me eminently favourable to its future. Watches have been hitherto something of a luxury. It is only within the last few years that the art has been discovered of making them so cheaply as to be in the reach of the ordinary artisan or day labourer. They are so useful, even so necessary, that no person who can afford one will willingly go without. We have therefore opened to us an immense new market, subject no doubt to Swiss and American competition, but otherwise not likely to be much affected by the ordinary fluctuations of trade. As to the past experience of the company, so far as it has yet gone, I shall leave it to be explained by those who have practically carried on its affairs. Everything that I have heard inclines me to believe in its future. Even if that future were not all that we desire, or expect, we should still have the satisfaction of having made an honest effort to give useful employment to our neighbours and to increase the prosperity of the district. But I see no reason so far for any but sanguine views, and in any case we may be assured that in the working of this company there has been nothing that will not bear the light. No guinea pig directors sit on the board, no promoters have filled their empty pockets at the cost of the *bonâ fide* investor.

THE SHARES HAVE NOT BEEN PUFFED UP TO A FICTITIOUS VALUE,

all has simply been straightforward and above board. If the same thing could be said of many industrial undertakings in this country—undertakings on a much larger scale—there would not be so many ill-gained fortunes and not so many burnt fingers amongst investors. There is an old story that there are some speculations like a cold bath—very wholesome if you do not sit in it too long. Now, ours is not one of that sort ; I mean to stay in it, and I shall recommend all my friends to do the same. All these things we see around us look like business, and Mr. Hewitt's report is very promising. I do not think I am letting any cat out of the bag, or saying anything I ought not to say, when I tell you, as far as I can make out of the figures, upon the capital actually employed in the business there has already, in a year when things are not yet in full work, been earned a dividend of 10 per cent. I don't say you will get it. It may be a part of wisdom to make provision for the future, and, in point of fact, until the affairs of the company are in a more advanced state, I do not think it would be prudent to go into details. But, as far as I can see, I believe we are in a fair way to success, and I am quite sure we have done all that is possible to deserve it.

THE STARTING OF THE ENGINE.

Mr. Hewitt : We now propose to go and start the engine. His lordship has kindly consented to turn on what I hope will be a pulse that will beat for a long time.

Lord Derby and a few of the gentlemen on the platform then left, and when the company present saw the shafts and the drums in motion an enthusiastic cheer resounded through the factory, followed by the strains of "Rule Britannia" from the 2nd V.B.S.L.R. band, under the conductorship of Bandmaster Hall.

On the return of the gentlemen to the platform,

Colonel W. W. Pilkington was asked to address those present. He said : My lord, ladies, and gentlemen, I think old Prescot is very heartily to be congratulated upon to-day's proceedings. We may look upon these proceedings from three points of view—patriotic, philanthropic, and utilitarian. Now these proceedings to-day, so manifest a success, have been the work of a number of men who have had the determination that an old English industry shall not be trampled out by foreign competition. And whilst looking to the Government, to whom they ought to look for all legitimate defence in that way, they are determined not to be left, and whilst thanking Mr. Forwood and other gentlemen for the help they had given them in this matter, they are determined to put their shoulder to the wheel, or perhaps their spring to the wheel, and make it successful. Looking at it from a philanthropic point of view it is a thousand times better that Prescot, instead of dying down in misery and poverty, should be the home of success and prosperity and happiness. But looking at it from an utilitarian point of view, for after all that to-day is the most important, this watchmaking establishment was founded upon a thoroughly sound commercial basis. It is not a political institution, it is not a philanthropic institution, or anything of that kind, it is a thoroughly solid commercial undertaking. It has two elements of success. It has at its head men who know their work better than any other people in the country, and they are to be served by workmen such as you will find none better, I believe, in any country. They have a certain amount of money; they seem to think they want some more. I hope they will get it if they really do want it. But there is also one element which we don't always, and I am sure we don't often, find in limited liability companies, that is the men who manage it are the most largely interested themselves. They have the largest number of shares in the ship, and if it sinks they will sink with it, and serve them right if it does. I don't know that they know much else, so that they are obliged to keep it from sinking. But it will do nothing at all of the kind. Now we have a special reason for congratulation to-day, and that is that the head of our leading Lancashire family has come down to open this watch factory, and I think, if I may be allowed for a few moments to represent the Lancashire industrial population, I may say that we, the industrial population of Lancashire, thank him most heartily for coming and opening this factory, and in that way helping one of our old Lancashire industries, and preventing it from going to the wall. It has been said, I believe, my lord, that you were to turn on the steam. We must thank you not only for turning on the steam, but for helping us in getting up the steam. I cannot thank you as one of the shareholders, but I thank you, as a Lancashire man, on behalf of the Lancashire industrial population, for your kindness in coming this afternoon.

Letter from Baron de Worms.

The Chairman announced that the following letter had been received from Baron H. de Worms, M.P.:—"Hotel Paradis, Nice, January 7, 1890.—Dear Madam,—The Baroness and I are very much obliged for your kind invitation ; we should have been happy to avail ourselves of it had we not been obliged to remain here, where I am recruiting my health after a very severe attack of Russian influenza. I hope you will kindly assure my friends at Prescot that I take the deepest interest in the success of their new factory, marking, as it does, the revival of an old industry which I do not doubt will again prosper to the material advantage of your town. You are good enough to say that my work in connection with the passing of the Merchandise Marks Act has materially contributed to this result ; nothing could have afforded me greater satisfaction than this expression of opinion. It was on the strength of the views conveyed by the deputation I had the honour of receiving at Prescot that the so-called 'watch clauses' were introduced into the Act, and the evidence of the representatives of the watch industry of Prescot, given before the Select Committee of the House of Commons, over which I presided, materially assisted me in getting them accepted and passed into law.—I am, dear madam, very faithfully yours (Signed) H. de Worms.

"Mrs. Hewitt."

Mr. A. B. Forwood, M.P., said : I assure you it affords me infinite satisfaction to be able to come to Prescot to meet my constituents of all shades of opinion upon a common platform for the purpose of promoting the industries of the district, to come amongst you free from the hurry and worry of party strife, and to be able to congratulate Prescot on obtaining that which she has so long and so well deserved—a large watch factory. Now, I look back only for three or four years, and I well remember meeting your Chairman and others interested in the industry of Lancashire in a small room when this factory was only being talked about. We met then to discuss what could be done for the benefit of the watch industry of the country. Our object in meeting was to see if advantage could be taken of the Merchandise Marks Act that was then being introduced by his lordship's brother, as Vice-President of the Board of Trade. And although a member of the administration—and perhaps his lordship will chide me if I say anything as to communications with a colleague in the Ministry—yet I am bound to say you owe that clause in the Act which was passed for the protection of the British Workman from fraud, you owe that clause mainly and largely to the fact that Lord Stanley of Preston, belonging as he does to the noble family of Stanley of Knowsley, took a deep and personal interest in the cause that was brought before him from Prescot. I was saying it was only three or four years ago since we had that meeting, and I must express my surprise and gratification in coming in at that door to see so large a building, which I understand will afford employment, direct and indirect, for something like 500 people. To find within that time that the energy of Prescot had erected a building like this is surprising, and when your chairman calls it only the first section, I feel that you have a great future before you in this district. Now the interview that I had here at that time caused me to have some other interviews with gentlemen connected with the industry in London, and having paid several visits to America, and knowing something of the general character of the people there, I made some remark about the great Waltham Watch Factory, and I was told a story, whether true or not I cannot say. I was told that a Swiss came over to Clerkenwell many years ago with a very ingenious mechanical device, which was to effect a great improvement in watchmaking, but the people of Clerkenwell would not listen to it, on the ground that it would interfere with the handicraftsmen of that district. The result was that the man went over to America, his invention was taken up, and to that man was mainly due the enormous manufacture of the cheap watches in America. Now, here we have had no such feeling evinced. Here in Prescot you have been abreast of the times. You have recognised the fact that machinery must do a large amount of work, that machinery by cheapening the cost of production, increases the consumption of the article, and thereby causes work for a larger number of people to produce the article wanted, and by this recognition of keeping ahead of the modern Swiss, I believe you are aiming to give back to Prescot that industry which it was feared she would lose. Now may I say one more word upon this point. At one time foreigners always looked to Liverpool for the best chronometer in the world. Why it has lost the repute I don't know, but it has not got the name abroad standing paramount above the others that it used to have. I say to you now, don't be in too great a hurry. Don't produce anything but good goods. Now there is nothing that gains repute so soon as a good watch. Nothing will so promote the work you have in hand to-day as establishing a good name and a good repute. Your chairman said the Government had done something to help to protect the workmen and manufacturers of England. You have now got an Act passed properly to protect your interest, but to put that Act in force requires combination. Now the watch industry of this country ought to form a guild to protect themselves against the improper inroads of the foreigner in the way in which your chairman has expressed it. I hear a whisper on the platform that that has been done. I am again glad to find that Prescot is keeping ahead of the times, and is up to the modern way of doing business. A duty has been committed to me, and that is in your name as well as mine, to thank our noble neighbour for the interest he has evinced in our work to-day. I am sure that that proposition will be accepted with the cordiality which the name of Stanley has always received in Lancashire, or any part of England, and as his lordship has used the simile of a cold bath, and he invited those present to join him in that bath which he had taken, all I have got to say is, if I for one can find any of those who wish or desire to part with their shares I shall be very glad to share that cold bath with his lordship. I heard from the chairman with the greatest pleasure the remarks that not only was this factory proving a benefit to the capitalists of 10 per cent.—that sounds very well with Consols at 2¾ and a prospective 2½—but it was going to benefit the labouring men by better wages. We hear a great deal of profit-sharing, but I know of no better way in which a working-man can share in the profits of an undertaking in which he is interested than by taking up some of the shares in the institution in which he works, because, as you all know well, nobody stands between the man who owns the share and the profits—there is no promoter and no guinea-pig director, but it is a direct interest in the surplus earnings, and comes from the labour and capital employed. I have great pleasure in proposing a vote of thanks to Lord Derby for his presence here to-day.

Mr. S. H. Hartley (chairman of the directors) said: In seconding this vote of thanks I will speak, if you will permit me, in the name of the directors of the Lancashire Watch Company. His lordship's reputation for astuteness, for caution, and for keenness is universal, and they regard the fact of his having paid for all his shares in full in advance as evidence of his lordship's confidence in the soundness of this undertaking, and they venture to express their view that his lordship's reputation will not suffer by being associated with the Lancashire Watch Company; others have reputations, besides his lordship. The artisans of Prescot have had the reputation for 200 years for being able to make the best movement to be purchased in this country, and we cannot conceive that that reputation is likely to be impaired by the introduction and by the aid of improved machinery—it must, of necessity, be enhanced. His lordship spoke of bragging; the directors do not desire to brag, but they are almost vain enough to think they have done pretty well towards making a reputation for themselves during the last twelve months as capable business men, and men competent to direct, control, and manage the affairs of a public company. Let credit be given to whom it is due. We are free to admit—at any rate, I am—that the success of this company, and it is a success, is attributable mainly, if not solely, to the untiring zeal, the unceasing watchfulness and skill and ability of the managing director, Mr. T. P. Hewitt. When this company was floated, some twelve or fourteen months ago, the directors issued a prospectus to the company, in which they stated that they had regulated their price list to enable them to extend the manufacture of watch movements, to retain the trade of the several firms they had taken over, to pay their workpeople better wages, and to ensure a return of upwards of 10 per cent. on the capital invested. From the moment of our joining that board of directors we felt that upon us rested a grave responsibility; for if, by some careless omission or some stupid blundering, we wrecked the company, not only would the money be lost, but the men would be thrown out of employment, and we should have been retarding the progress and advancement of Prescot for many years. It may be that the directors are climbing Mr. Hewitt's ladder of fame, but, however that may be, we have certainly, during the last twelve months, worked harmoniously, patiently, zealously, and faithfully in the best interests of all concerned, and to-day we are able to say that this company is in a sound condition, and of its stability there cannot be the slightest doubt. At the annual meeting of the shareholders, to be held next month, we will be able to prove that we have extended our operations in the shape of more movements having been turned out. We have retained the trade of the firms we took over, and we paid last year over £17,000 to the workmen, and we are in a position to give the shareholders 10 per cent., if they care to take it. This factory is not only to contain skilled artisans, but machines of the most advanced and modern type. There are persons who say that the introduction of these machines will destroy altogether hand labour, and that it will be difficult shortly to find employment for those now engaged in the industry. This might be true, if it were intended to restrict the operations of the company to movement making alone, but it is not so intended, and it must not be. We do not wish to convey the idea that the movement making will be discontinued. We are prepared to make movements, or any other article, so long as we can get a proper price for it to enable us properly to compensate the men who are employed, and to give a fair return to the capitalist who has invested his money with us. If these conditions are absent we will decline to make the article. We will let the industry go rather than let it be carried on at the expense of the life's blood of our workpeople. This factory and the machines in the adjoining room are only the first instalment, we expect to have two other factories larger than this, and when we have a full and complete complement of automatic and other machines, with the necessary tools and appliances, instead of employing 400 or 500 men as at present, we shall employ four or five thousand. We now proceed with all speed, but with due caution, to the making of a complete watch in Prescot, which we predict will be the timekeeper of the future. The judicious outlay of sufficient capital in Prescot would prove advantageous to an investor who would also find employment for thousands of hands, and at wages which we hope will enable the head of a family to provide not only the necessaries of life, but some of its luxuries, to provide him a brighter and happier home, that will enable him to feed and clothe his children better, and to give them an education, it may be superior to that with which he was favoured, and above and beyond this to enable him to lay aside a competency for a time which may come upon him when his eyes may grow weary and dim and his right hand have forgotten its cunning.

Lord Derby, in acknowledging the vote on behalf of himself and Lady Margaret Cecil, and expressing his thanks for their kind reception, said that on getting up in the morning he looked with a rather uncomfortable sensation at the sky. He did not know of the admirable arrangements that had been made for that meeting, and it seemed to him extremely probable that he might have to do what he had often done before—address a very dry speech to a very damp audience. They had, however, provided against all atmospheric casualities, and he must say he thought it a good omen for the future, and a good sign of the way in which the company began the work that that shed, which so admirably served the purpose of the present meeting, had been obviously constructed according to the latest sanitary requirements. He quite agreed with what Mr. Forwood had said as to the extreme desirability of inducing, without holding out any over-coloured expectations, to induce those who worked on the building to take shares. The shares were fixed at a very moderate amount—£10—and he should be very glad to hear that those concerned in the business were those to have a direct interest in the pecuniary result. Let them not in their zeal for the extension of the company, make the mistake of going about begging and imploring the public to take shares. There was no need of that; dividends would speak for themselves. He thought the time would not be distant when, instead of the company considering itself indebted to any intending investors, these investors would consider themselves indebted to the company, who were lucky enough to get shares alloted to them. As to his own shares, he could only say that, though he had had very little personal trouble with them, no man was more warmly interested in the company's success, and he should be glad to do all he could to promote its success.

The Rev. H. Mitchell said: Some people think it is very funny that I have got anything to do with the watch factory at all. They seem to think that my business is organising penny dinners, and doling out yards of flannel and half-crowns. It has always struck me that the best thing to do was to help to arrange things so that there should be no necessity for doles at all. For isn't it much better to help people to help themselves if it be possible and so remove the necessity for doles? I think so, and therefore have gone on steadily pegging away at this wage-paying machine for more than two years. I have not had some hundreds of conversations with Mr. Hewitt without becoming absolutely convinced that your manager has thoroughly at heart the good of the men and women who work under him. I know that Lord Derby, under that critical and judicial mind of his, has a keen desire to advance in all sound ways the well-being of our working men and women. I see that our directors are not bloated capitalists, living far away, but they are your fellow townsmen, and every one in touch with the people. When I think of these things I am convinced that within these walls there will be perfect justice done to those who work here, as well as to those persons who have provided the money. But this actory, even when enlarged and turning out watches and all those other ingenious machines which are sure to be invented, is only, to my mind, one of the means to a great end. At present Prescot is, I believe, one of the poorest townships in the whole of England. A penny rate brings in £40 only. Now what could a Local Board do when a penny rate only brought in £40? Our Local Board has just been evicting pigs from their styes, but as a working man said to me "they are leaving the styes for the people to live in." Now that is perfectly true. There are hundreds of habitations in Prescot little better than styes, and they must go down. I look to these gentlemen and this factory to do away with this sort of thing. Already this factory has given value to property. Some 100 new houses are being built, and I hope and trust we shall see another 100 up, and for every house put up one goes down. I hope we may soon see a vigorous policy of reconstruction set in motion by our authorities. Then again our working men have absolutely no place to meet in of an evening. There is not a clubroom in the town except the Conservative Club, which is for a special few. There is nowhere for our working men to go for social converse except the public-house. It is true there are 40 of these lying handy, and meeting us at every turning; but some of us think there ought to be a large convenient central working men's clubroom, a social club not connected with any particular school of thought, politics, or religion. But with this factory there will come a breath of new life into this decayed old town, new men from among yourselves and from other parts of the country will rise into positions of responsibility and power, and it will be a bitter disappointment to me if ten years hence Prescot shall not have risen out of its poverty crippled state into a condition of comfort and prosperity, in which the surroundings of life shall be changed. We ought to have a public recreation ground too. Prescot can't play! It has no place whatever, even to fly a kite, without trespassing, unless it joins a football club and can rent a field for the winter. In summer it cannot make sure of getting a field at all. I hope in ten years from now Prescot shall be so changed for the better, that instead of tending to degradation, as the people too often do now, they will help themselves, your sons and daughters, to lead happy, temperate, pure, and Christian lives.

Mr. T. Worthington said he had been asked by the workmen to perform a little duty which had been left off the programme. He moved that the thanks of that meeting be given to Mr. T. P. Hewitt, the managing director of that company, for his conduct that day, and for the energy and ability he had brought to bear on that undertaking. He had known Mr. Hewitt for some time, and he knew there was no more honest man in Lancashire than he was. His honesty and integrity would stand the test of any person. Mr. Hewitt had told him that if the concern did not pay he would not draw a penny of salary. Mr. Hewitt's energy needed no eulogy from him. When they looked at that grand building, its machinery, and the end for which it had been built, he thought it spoke volumes to the energy and untiring zeal of Mr. Hewitt. He would ask the working men of Prescot if the confidence Mr. Hewitt and others had placed in them was going to be misplaced. He ventured to say that on behalf of the workmen who had helped to carry that through it would not. He had no doubt they would do their best to turn out the best material, and that they would show themselves worthy of that great undertaking. He had great pleasure in proposing a vote of thanks to Mr. T. P. Hewitt.

Mr. Ashcroft, an *employe*, seconded the proposition, and said it was with pleasure he bore testimony to the ability of Mr. T. P. Hewitt. As an employer of labour he was a gentleman who considered his workpeople, and in this respect he did not think there was his equal in the county of Lancashire, and he was worthy the respect and esteem of every individual in the town of Prescot. He hoped and trusted the time would come when the name of Mr. Hewitt would be looked on as the founder of a great concern in Prescot. He believed the watch industry, with Mr. Hewitt at the head, would be a thorough success. It only depended upon the working people rallying round him, and he was sure he was conveying the feeling of every working man in the town when he said they would rally round him with renewed vigour in that great enterprise that had been started that afternoon. He thought they had reason to take encouragement, and be thankful that their lot had been placed under the guiding hands of their directors, and the manager's direction (Mr. Hewitt). He had great pleasure in seconding the vote of thanks.

The proposition was then put to the meeting and carried with enthusiasm.

Mr. T. P. Hewitt, in reply, said he was pleased to know what little he had done had been recognised, but he thought they had estimated his services at too high a price. He really did feel pleased they had the confidence of the workmen with them. He was a working man himself. He worked hard, and had worked hard at the bench, and it was a great source of strength to him to know that they were all working together. They were not as it were master and man; they mixed together, and treated each other as gentlemen all round. He hoped they would all go up the ladder together, and they were going and meant to go. He then asked those present to give three hearty cheers for Lord Derby, and this was done in true Prescot fashion.

Afterwards the guests adjourned to the general office, where refreshments were provided, supplied in satisfactory style by Mr. Geo. Eaton. Afterwards Mr. Eaton catered a good knife and fork tea for the 600 workpeople, who sat down in the factory at six o'clock. At the conclusion of the tea a most enjoyable dance was indulged in to the strains of the 2nd V.B.S.L.R. Band (under Bandmaster Hall), and was kept up until eleven o'clock. At intervals during the evening a programme of songs was gone through, Mrs. Michell (of St. Helens) accompanying on the pianoforte, as well as playing several pianoforte selections in an accomplished manner. The vocalists were Miss E. J. Hewitt (St. Helens), Miss Lucas (Liverpool), Mr. E. Edwards, Mr. W. Tyrer, and Mr. J. H. Brockbank. The artistes all acquitted themselves satisfactorily, Mr. Brockbank's contributions being particularly effective.

The plants which decorated the room were lent by Mr. Whitaker, Mrs. Stead, Messrs. Beesley, and Mrs. Hale, matron of the workhouse, to whom and to Mrs. Hartley special credit is due for the tasteful decoration of the factory. Committees were formed to look after the cleaning and clearing of the room, the tea making, the collection of tickets, &c. The following comprised the committees:—Messrs. W. Beesley, John Beesley, Geo. Dagnall, H. Watkinson, T. Coffey, John Forster, A. Forster, Wm. Bromilow, Jas. Robinson. J. and W. Jackson, W. Sephton, sen. and jun., John Waine, John Dickinson, J. Ackers, M. Jackson, J. Lyon, J. Welsby, Peter Hall, George Naylor, John Leadbetter, J. H. Sephton, R. Greenall, J. Starkie, John Hall, Jas. Case, sen. and jun., Wm. Foster, Wm. Corns, John Barron, R. Rigby, W. Denton, Wm. Heaps, Thos. Rose, W. Large, and Benjamin Jandrin. Mrs. A. Molyneux was in charge of the of the ladies' cloakroom, and Mr. R. Norman in charge of the gentlemen's cloakroom, while the refreshments were looked after by Messrs. W. Beesley, A. Beesley, Jas. Beesley, J. W. Prescott, Hy. Whitfield, J. Whitfield, and W. Ashcroft. The reception room was fitted up by Mr. Samuel Cutter, of Bold Street, Liverpool, who is making the office furniture.

1889 and 1890.

THE *New York Jewellers' Weekly* in its initial number for the New Year, has the following editorial article on the above:—

To-day, the first of business in 1890, the old books of every well conducted house will be closed, and upon the first spotless page of a new volume will be written the conditions under which the firm is to take up the gauntlet tendered by its competitors. Competition is to be as sharp as tradesmen have ever found it. Well-informed men assert that year by year the struggle is becoming more determined, and the facts are such that we are not prepared to dispute the statement. The profits of the year have been bestowed as rewards for intelligently directed effort and keen foresight. Business foresight is personal in its character, and while not prepared to accept the theory that it comes only with birth, we are obliged to recognise it as an attribute that one cannot confer upon another. Methods may be communicated by one to another far more readily than learned by each for himself. In printing what follows, the *Weekly* does not desire to dictate to any tradesman. We strive to render its statements worthy of implicit confidence and its opinions logical. With that spirit pervading every word of what follows we submit that a few methods have helped establish the successes of the past season. Whoever has enjoyed a profitable trade has surrounded himself with honest and conscientious help. Irrespective of reasonable expense, he has selected for his place of business a respectable building in a quarter of the town suited to his trade; he has required his employees to courteously receive all customers, and has set the example for them by himself impersonating courtesy; he has sold seasonable goods at a reasonable profit, cutting prices only on such stock as is well sold if sold at all; he has not grudged the labour of replying to what some people have chosen to term foolish questions; he has been guided by a sense of his own integrity; he has bought well and sold better, and the latter is due to all things before-mentioned coupled with judicious advertising. Without customers, the affability of clerks, many of the advantages of location, the cutting of prices on old stock, and the honesty he possesses will count for little. The great world must know of these things to appreciate them, and, pray, how can the world know if they are not often brought to its notice? The jobber who does not advertise will sit alone in his office, while the stores of his enterprising competitors are thronged with retailers who are unaware of his existence. There is, however, a difference between advertising, and merely publishing an advertisement. It is as necessary that the paper in which an advertisement is printed should have a reputation for reliability and originality, as that the advertiser shall have something worth advertising. Neither the amount of space that can be bought for a given sum nor the number of copies circulated is an infallible indication of the value of an advertising medium. The number of papers read is the fairest measure. The advertiser who has been foolish enough to scatter broadcast half-a-million circular letters has more than once been astounded that less than a hundred replies have been received. The shrewd advertiser is the one who ascertains what journal is looked upon with confidence and favour by the people with whom he wishes to deal, and who constantly employs it to say to his customers exactly what he would say to them if he could personally talk with them. Such men are now counting the profits of last year's trade, and will be the reapers of the harvest of 1890. They have a happy new year, and will, we trust, enjoy many glad returns of it.

Serious Charge against a Jeweller.—At the Liverpool Police Court, on the 13th ult.—before Mr. Raffles—John Carswell, *alias* Campbell, described as a watchmaker and jeweller, and a native of Glasgow, was brought up by warrant charged with larceny. The prisoner apparently was in a very weak state of health, and he had the previous morning arrived from Montreal by the s.s. Etruria. Detective-Sergeant Ferguson stated that when he arrested the prisoner he read to him a cable despatch describing him and stating the offence with which he was charged with committing at Montreal. The prisoner confessed he was the man referred to, and said he was unable to meet his creditors in Montreal, and so he brought over his goods to start in this country. He did not know what they meant by larceny. Mr. George Williams, chief of the detective department, said, in the ordinary course, his Worship would be asked to issue a conduct warrant to take the prisoner to London, but having regard to the medical certificate the police authorities thought it was desirable that he should be placed in a hospital for a week rather than run any risk in his removal to the metropolis. An officer from Montreal was already on his way to this country to take the necessary steps to secure the prisoner's extradition. In reply to Mr. Raffles, the prisoner said he would prefer the workhouse hospital to the gaol hospital, and he was remanded for seven days to this institution.

Results of Watch Trials at Kew during 1889.

Table I.

PERFORMANCE OF THE 26 WATCHES WHICH OBTAINED THE HIGHEST NUMBER OF MARKS DURING THE YEAR.

Watch deposited by	Number of watch.	Balance spring, escapement, &c.	Mean daily rate. + Gaining. — Losing.	Mean variation of daily rate. ±	Mean change of rate for 1° F.	Difference of mean daily rate: Between pendant up and dial up.	Between pendant up and pendant right.	Between pendant up and pendant left.	Between dial up and dial down.	Difference between extreme gaining and losing rates.	Marks awarded for: Daily variation of rate.	Change of rate with change of position.	Temperature compensation.	Total Marks. 0—100.
			secs.	secs.	secs.	secs.	secs.	secs.	secs.	secs.				
E. F. Ashley, London	03801	Single overcoil, *s.r., fusee	+1·4	0·35	0·04	—0·1	—0·2	—0·6	—0·6	4·25	33·0	38·9	17·2	89.1†
A. E. Fridlander, Coventry	52292	Single overcoil, d r., fusee	+1·9	0·4	0·01	—0·8	—0·1	—1·1	—0·9	4·0	32·1	37·7	19·2	89·0†
E. F. Ashley, London	03770	Single overcoil, s.r., g.b.	—0·9	0·4	0·06	+1·0	+0·3	0·0	—0·1	3·75	32·2	38·3	16·1	86·6†
W. Holland, Rock Ferry	3612	Single overcoil, d.r., fusee, centre-seconds	+0·9	0·4	0·05	0·0	+0·1	+0·5	+1·5	5·0	31·6	38·2	16·5	86·3†
Stauffer, Son & Co., London	126681	Single overcoil, d.r., g.b., bar-lever	—7·8	0·4	0·05	+0·8	—2·2	+0·9	—1·5	6·25	31·8	36·1	16·8	84·7†
Joseph White, Coventry	32133	Single overcoil, d.r., g.b	—4·7	0·4	0·04	—0·7	—1·8	+1·2	+2·8	5·25	32·2	35·2	17·1	84·5†
Baume & Co., London	2836	Single overcoil, d r., g.b., bar-lever	+1·0	0·5	0·04	+1·2	+0·8	—0·8	—2·4	4·5	30·6	36·5	17·3	84·4†
Usher & Cole, London	25430	Single overcoil, s.r., g.b.	+0·3	0·5	0·06	—0·9	—0·3	—0·7	+2·1	6·75	30·2	37·6	16·3	84·1†
Rotherham & Sons, Coventry	84377	Single overcoil, s.r., g.b.	+2·9	0·4	0·05	+4·6	+0·8	+1·0	—3·2	7·0	31·8	35·1	16·9	83·8
J. J. Stockwell, London	10416	Single overcoil (palladium), s.r , g b.	—1·9	0·4	0·03	—2·7	+3·1	+0·5	+1·8	8·0	31·7	34·2	17·9	83·8
Rotherham & Sons, Coventry	84278	Single overcoil (palladium), s.r., g.b.	+2·3	0·5	0·03	0·0	—0·9	—1·6	—3·2	6·25	30·6	35·1	18·0	83·7†
Stauffer, Son & Co., London	124228	Single overcoil, d.r., g.b.	+2·8	0·4	0·04	—2·0	+1·3	+3·0	+1·7	8·0	32·0	34·4	17·2	83·6†
Joseph White, Coventry	31614	Single overcoil, d.r., g.b., centre-seconds	+0·1	0·5	0·04	+1·4	0·0	+2·5	—0·5	4·75	29·3	36·8	17·4	83·5†
H. Golay, London	2808	Double overcoil, d.r., g.b.	+2·8	0.5	0·03	—2·3	+1·2	—2·3	+0·3	7·25	30·6	34·6	17·9	83·1†
Baume & Co., London	2786	Single overcoil, d.r., g b., bar-lever	+1·3	0.4	0·05	+1·2	—1·8	—0·6	—4·0	5·25	31·2	35·2	16·5	82·9
W. Holland, Rock Ferry	3641	Single overcoil, d.r., g.b., centre-seconds	+0·3	0·4	0·07	+0.6	—2·9	—1·9	—2·5	5·5	31·6	35·3	15·2	82·1†
W. Holland, Rock Ferry	3247	Single overcoil, d.r., fusee	+0·1	0·6	0·01	—1·0	+1·6	+1·9	—0·1	6·5	27·6	35·3	19·1	82·0
Joseph White, Coventry	31812	Single overcoil, d.r., g.b.	+2·8	0·6	0·06	—0·8	—0·9	—1·3	+1·0	6·0	28·4	37·8	15·8	82·0
A. E. Fridlander, Coventry	52625	Single overcoil, d.r., g.b.	+2·2	0·4	0·07	—0·1	+2·4	+2·8	—0·7	6·25	31·9	34·5	15·1	81·5†
Gaydon & Sons, Kingston-on Thames	55781	Single overcoil (palladium), dr., g.b	+1·9	0·5	0·07	—1·8	—1·4	—3·9	—0·4	7·25	29·9	36.2	15·3	81·4
E. F. Ashley, London	03784	Single overcoil, d r., fusee	—0·6	0·4	0·10	+1·5	—1·0	—0·6	—0·4	6·25	31·1	36·5	13·5	81·1†
Stauffer, Son & Co., London	124225	Single overcoil, d.r., g.b.	+4·2	0·6	0·07	+1·0	+1·0	+1·0	—0·5	6·25	27·4	38·6	15·1	81·1
A. E. Fridlander, Coventry	52498	Single overcoil, d r., g.b.	+2·9	0·5	0·05	—0·6	—2·1	—5·2	—0·5	8·0	30·4	34·0	16·7	81·1
A. E. Fridlander, Coventry	52483	Double overcoil, d.r., g.b.	—1·9	0·4	0·04	1·9	+3·7	—4·6	+1·3	0·0	32·0	31·9	17·1	81·0†
Baume & Co., London	2778	Single overcoil, d.r. g.b., bar-lever	—1·7	0·5	0·07	+0·3	0·6	+1·4	—3·1	16·25	29·8	35·6	15·6	81·0
L. Rozat, Chaux-de-Fonds	42102	Single overcoil, s.r., g.b.	+6.1	0·7	0·04	—0.1	+1·0	—0·1	+0·9	5·75	25·8	38·1	17·1	81·0

* d.r., double-roller; s.r., single-roller; g.b., going barrel.

† Especially good.

Table II.

HIGHEST RECORDS OBTAINED BY COMPLICATED WATCHES AT KEW DURING THE YEAR 1889.

Description of Watch.	Number.	Deposited by	Marks awarded for: Variation.	Position.	Temperature.	Total marks, 0—100.
Minute and seconds chronograph and repeater	52625	A. E. Fridlander, Coventry	31·9	34·5	15·1	81·5*
" " " "	14781	S. Smith & Son, London	27·0	28·6	9·1	64·7
Split-seconds and minute-recorder chronograph	2836	Baume & Co., London	30·6	36·5	17·3	84·4*
" " " "	2813	H. Golay, "	26·7	33·8	15·5	76·0
" " " "	125935	Stauffer & Co., "	25·2	35·0	14·2	74·4
Minute and seconds chronograph	52483	A. E. Fridlander, Coventry	32·0	31·9	17·1	81·0*
" " "	124440	Stauffer & Co., London	30·2	32·8	17·9	80·9
" " "	3678	H. Golay, "	27·5	35·7	17·0	80·2
Repeater	1703	W. Vasel, London	30·7	35·3	10·2	76·2*
"	30388	M. F. Dent,	26·7	31·2	15·8	73·7
"	3677	H. Golay, "	28·7	29·1	13·4	71·2
Ordinary seconds chronograph	30822	S. Smith & Son, London	25·1	28·4	9·7	63·2
" " "	99771	Newsome & Co., Coventry	23·6	28·7	10·4	62·7

* Especially Good.

Diamonds.

UNTIL within a period of 150 years the East Indies furnished all the diamonds found in the markets of the world. In Hindostan and Borneo the precious gems were found in detached crystals, accompanied with grains of gold, among metallic sand washed down from the mountains. When the poor miner, says *Fireside Science*, who wandered into the mountainous districts of Brazil in pursuit of gold accidently stumbled upon the famous diamond mines of that country, the whole world was filled with excitement, and the number of miners who crowded thither was very great. The quantity of gems of the very first water obtained from these mines was sufficient to keep the gay and luxurious courts of France and Spain in a blaze of light, as the noble ladies of the time adorned their persons with them. The region of country in Brazil in which diamonds are found is extremely limited. The district of Minas Geraes extends only about eighty miles north and south, and eight from east to west. The character of the earth is an agglomerate, formed by the decomposition of granite and mica slate, and is made up of rounded white pebbles and light-coloured sand; in this mixture the diamonds are found along with grains of gold, sometimes crystallized. It is curious that the nature of the earth and the deposits corresponds with that of Hindostan and Borneo where diamonds exist. No one knows how a diamond is produced, or where its natural home is. If its original position is a rocky matrix, as is suspected, it is certain that no one has ever seen it. The chemist or mineralogist who will furnish a diamond involved in its primitive home will certainly shed light upon an interesting scientific problem, and render his name famous. The mountains which supply the débris that hold the gems are composed of schistose rocks, intermixed with quartz, sandstone, brescia, flinty slate, limestone, etc. The limestone brescia is the only rock in which diamonds are found in the mountains, and this comprises all we know regarding their original position. By what subtle chemical processes the brilliants have been formed, at some time in the course of those stupendous changes to which our planet has been subjected, we have no knowledge. Undoubtedly fire, water, gases, pressure, etc., have all been concerned in the synthetical work. Chemists have not yet been able to manufacture colourless gems, and it is doubtful if the process is ever understood. In an industrial view the problem has but little practical importance.

There is no city or town in the United States where the difficult and interesting process of diamond cutting is carried on but in Boston and New York. In company with Henry D. Morse, the originator of this peculiar manufacture, we visited a factory in Boston where the work is done, and the hour spent in inspecting the process was full of interest. Diamond cutting has been for years monopolized by Holland, and in the city of Amsterdam some 2,000 men are constantly employed in the industry. With the long experience, however, of these workmen, some of the finest stones are very unskilfully cut, and those brought to this country have been placed in the hands of Mr. Morse to be recut and perfected.

The machinery employed in Holland for polishing is ponderous and heavy, the framework holding the wheels being braced and wedged like the running gear of a country saw mill. In the establishment in Boston a small iron-top table is used, with, solid iron supports and double bearings, so that the polishing wheel, being fixed in the centre, revolves horizontally on a level with the surface of the table. By this ingenious device, the work of Mr. Morse, perfect steadiness is secured, and without the clumsy machinery of the Dutch manipulators a greater degree of accuracy is obtained.

To cut a diamond is to form its surfaces so that light, in passing through, is refracted in a way to produce a maximum of brilliancy. The rough gems are quite dull or lustreless, and it requires consummate skill in cutting and polishing to secure the accuracy of angular proportion in the faces necessary to perfect results. There must be principal planes or faces, and around them a considerable number of smaller ones, all placed at correct angles, so that, by refraction, a blaze or light, every ray in harmony, may be the result. The skill of the operator is shown in his ability to bring out the whole power of a stone.

The diamond is the hardest of known substances, and hence the inquiry will naturally arise, "How is it possible to produce mechanical effects upon a substance so refractory?" "Diamond cut diamond" is an old adage, and it has a practical illustration in the factory. The dust of the gem is employed to wear away the surface of those undergoing the process of polishing, and this is obtained by grinding worthless particles in a steel mortar, and also the minute fragments obtained in the progress of the work are saved for the purpose. But these two sources of supply do not afford sufficient material to meet the wants of the industry, and consequently a substance found in association with diamond, and possessing equal hardness, is to a large extent employed. This pebble, which has no value as a light refractor, is pure carbon, like the diamond, but it is not perfectly crystaline. It is semi-amphorous in structure; and if it was not used for its mechanical value, it would be as worthless as a bit of charcoal. It is now worth in the market about 6 dols. a pennyweight.

When two diamonds are rubbed together they are mutually abraded or worn away, and hence if we have a valuable one which we wish to cut, to develop its brilliancy, we have only to select another which by its shape is worthless, and bring this to bear mechanically upon the other, and the work goes on. The worthless diamond may be called the tool with which the cutter elaborates the valued gem. Each is placed in cement, conically heaped at one end of two sticks of convenient handling size. The cutter is so placed in soft cement that its cutting angle can be employed to the best advantage upon the clear stone, which is similarly adjusted to present the surface to be abraded. After the cement has hardened, the workman grasps the stick, holding the cutting diamond in his right hand, and that with the gem in his left, and the stones are brought together over a double metallic box, the inner section of which is provided with a perforated bottom, being half the depth of the outer, into which it closely fits. The particles which become detached from both stones fall into the inner box, the smaller passing through the orifice, to the bottom, being fine enough to perform their functions on the polishing-wheel. The coarser grains are afterwards, as we have stated, powdered in a steel mortar. Diamond cutting is slow and tedious work, and requires the utmost care and skill to accomplish the process successfully. In the Boston factory, the labour is done under the eye or immediate supervision of Mr. Morse, who originated the industry, and who devised and constructed the machinery.

The diamond has a grain or cleavage plane, the same as most mineral or crystalline substances, and hence it is possible to split or divide one into two or more parts. Sometimes a large piece is removed at once from a gem by splitting, but it is a process attended with much risk. To accomplish this, after the stone is carefully studied and its line of cleavage ascertained, it is placed in hardened cement, in the proper position, and the sharp edge of a steel chisel resembling a razor is carefully adjusted, so that the division will be at the points desired, and a smart rap with a hammer is given it. Perhaps no more costly blow may be struck in any mechanical work than this, for in manipulating a large diamond, if it is unskilfully given, a gem of several thousand dollars' value may be spoiled.

After a diamond is cut, the work of polishing commences, and it is in this department that the American machinery is seen to be superior to the Dutch. This we have already described. The gem is adjusted in soft lead heaped conically in a copper cup, ten times the capacity of those used upon the cement sticks in cutting. The surface of the wheel is charged with diamond dust mixed with oil to the consistency of thin paste. The stone and wheel thus arranged, the latter is made to revolve at the rate of 1,500 revolutions a minute, and the stone, placed in a heavy iron clamp, is inverted upon the wheel. Nothing but the diamond touches the wheel, it being pressed down by the weight of the iron clamp. A rather musical tone is produced by the contact, which shows that the wheel is doing its work, and that now a bright surface will be produced upon the "table" exposed to its action. When this is satisfactory the operator melts the lead, releases the gem, and readjusts it so as to polish another of the facets, and in this way the process goes on until the work is completed. To attain this, however, the tables and facets are many times exposed to the wheel, and it is not until the most careful measurements and experiments are made that the gem is pronounced satisfactory.

Most of those who visit the jewellers' stores for the purpose of purchasing diamonds have no knowledge of the nature of the gems they seek. They do not know that a diamond, like a horse or an oil painting, is sold for its excellence or beauty. If a diamond is "off colour," or even has slight flaws, they do not detect the faults. If diamonds are sought it is important that they should be purchased of honest parties, and those who by experience are fully acquainted with their character and value.

The Prescot Watch Industry.

MR. J. TAYLOR, of Prescot, has favoured us with the following particulars with regard to the Lancashire Watch Factory and the opening ceremony, which, together with the verbatim report of the proceedings which follows, will be of interest to our horological readers:—The new factory was opened at Prescot on Saturday, January 11, by the Earl of Derby, in the presence of a numerous and distinguished company. The building is a long, oblong, one-storey red brick building, lighted from the roof, and furnishing accommodation for 570 hands. In the front are the commercial and manager's offices and a large reception room. Branching off from the main passage way is the designing room, and further along access is gained to the engineer's work room, fitted up with appliances for producing the delicate machinery used in the construction of the the modern watch. Through the engineer's work room, entrance is gained to the main workshop This workshop is lighted and heated on the principle adopted in the most recently-built factories, with the offices of the foremen overlooking the long ranges of workmen's benches of which each has charge. In the offices are boxes for the storage of finished work, and behind the offices in a long passage way wooden boxes are placed for the storage of the material, for the care of which the foremen are responsible. The factory covers some 200ft. by 70ft. of land. Each shaft in the main workshop is made to work two benches. The lubrication of the machinery is effected by an automatic arrangement, and power is supplied by a Marshall locomotive boiler and a compound engine of eighty horse-power. Every necessary convenience is, of course, supplied for the comfort of the workers; and it is a significant illustration of the aims and motives of the directors that they have resolved to pay high wages to their employés, whether the dividends be large or small.

Mr. T. P. Hewitt, the managing director, occupied the chair, and amongst those present, in addition to Lord Derby, were:—Lady Margaret Cecil, Lord Arthur Cecil, Mr. A. B. Forwood, M.P., the Rev. H. Mitchell (vicar of Prescot), Messrs. W. W. Pilkington (of the firm of Pilkington Bros., glass manufacturers, St. Helens), S. H. Hartley, A. D. Menzies, T. Dennett, J. Hewitt, W. Tyrer, etc. The interior of the factory was beautifully decorated for the occasion with flowers and evergreens, and flags and banners were exhibited in great profusion.

The doors were opened to ticket holders at 2 p.m., and in half-an-hour the building was crowded; his lordship (the Earl of Derby) arrived at 3 p.m. amidst great cheers, and as he entered the factory the band of the local volunteers played "Stanley for Ever." When he had taken his seat on the platform, the chairman introduced his lordship, and asked him to kindly open the factory by turning on the steam of the new engine; to this he kindly consented, and as the fly-wheel commenced to move the band played "Rule Britannia." When his lordship returned he spoke on the good commencement they had made and he hoped they would succeed; then Mr. Pilkington proposed a vote of thanks, and Mr. A. B. Forwood seconded the resolution. This completed the afternoon's proceedings, after which all the employés were entertained to a grand tea provided in the main workroom. After the tables had been cleared there was a grand entertainment and ball provided, in which 1,400 persons indulged. Refreshments were provided free by Mr. T. P. Hewitt, manager, and the party began to separate about midnight.

In reference to the foregoing the *Prescot Reporter* says:—It may safely be said that no reasonably exact and full history of Prescot will be written without making special mention of Saturday, January 11, 1890. The day might of course be said to be a "red-letter day" for the town, but that phrase is scarcely significant enough, unless important events are to be of much more frequent occurrence in Prescot in the future than they have been in the past. The day was not only striking as marking a great epoch in the career of the Lancashire Watch Company, but there was an enthuiasm and confidence about the whole proceedings which seemed to arouse a feeling, long absent from the breasts of many Prescotians, that brighter days are dawning on the good old town. "*Forti nihil difficile*" (To the brave nothing is difficult) was the appropriate motto of the late Earl of Beaconsfield; but it is to be feared that many Prescot people had, some few years ago, lost heart as to the future prosperity of their native place. Nor was this feeling to be wondered at, for whilst places in the immediate neighbourhood had flourished in an extraordinary degree, Prescot seemed to be getting poorer. However, the lane that has no turning is said to be a long one, and although many Prescotians have had a disheartening tramp within recent years, they seem to have found something worth having at the end of the journey. The proceedings were rendered specially notable by the presence of Lord Derby and two members of his family, and of the Provost and Bursar of King's College, Cambridge, the Lord of the Manor. We have made inquiries, but have not met anybody who knows when the Provost and Bursar of King's visited Prescot before. It has been a matter of great regret to people who have felt an interest in the town that the College authorities seem to be so little in touch with the place. During their stay in this neighbourhood, the Vicar of Prescot had the opportunity of laying before the Provost and Bursar a large amount of information, which we are certain must have been interesting to them, and which it is sincerely to be hoped will awake such an interest in the place as might reasonably be expected from parties who have such a large stake in it. Singularly, the present Earl of Derby's public visits to Prescot, prior to last Saturday, belong to a past generation. Over 30 years ago his Lordship, then Lord Stanley, was the prime mover in the formation of the Prescot Public Library. He attended a meeting at the Town Hall in connection with that project, and regularly sat on a committee, the only surviving members of which are himself, Mr. C. B. Johnson, and Mr. John Kershaw. The effort was one similar to others made by Lord Stanley at that time, in different parts of the country, to promote the reading of a good class of literature, and no better credential of his lordship's capacity 30 years ago need be asked than the catalogue of the Prescot Library, which was suggested almost *in toto* by himself. Since then the late Lady Derby and Lady Emma Talbot have taken considerable interest in the poor of the town, but affairs of State unfortunately called his lordship and his family away from this neighbourhood, and it is only within recent years that this kindly sympathy has been revived, in the first instance in the person of Lady Margaret Cecil. It must have been intensely pleasing to Prescot people to see Lord Derby taking his place on Saturday, as Colonel Pilkington put it, "as the head of the leading Lancashire family," and as a country gentleman, in a matter concerning the commercial and social welfare of his immediate neighbours. Prescot wants the sympathy and support of such a man; and the vicar is to be congratulated on laying the matter before Lord Derby in such a manner as to secure his lordship's presence. Lord Derby's remarks were, as they invariably are, admirably weighed, and the emphatic expression of belief in the project, given vent to by himself and Mr. Forwood, will perhaps carry more weight than similar words from the lips of any other two men in the country. Praise from them is praise indeed. Mr. Forwood must undoubtedly feel deep interest in the matter, for at the very commencement of the effort to revive the trade of the town he went into the subject with the local manufacturers with the utmost pains, and it is a pleasing and singular circumstance that Lord Derby's brother, Lord Stanley of Preston, was one of the few determined men (the few including Mr. Forwood and Baron Henry de Worms) who managed to pass the Merchandise Marks Act, in spite of the almost insuperable difficulty in the way of legislating at the time it became law. Mr. T. P. Hewitt, Mr. W. Tyrer, Mr. S. H. Hartley, and others, who have promoted the project with unswerving zeal, must have felt proud at the splendid building they admitted the public to on Saturday, and the brilliant success of the inaugural ceremony. The proceedings passed off with complete *éclat*, the speeches being excellent and to the point, with one or two slips which need not be particularised; and the event may certainly be chronicled as not simply a gigantic success so far as the Watch Company is concerned, but as a matter of vast significance for the future of Prescot.

Mr. Kunz's Collection of Native American Gems.

QUIETLY nestling in the beautiful and valuable collection of cut and uncut American gems sent by Tiffany & Co. to the great Paris Exposition, says the *New York Tribune*, are a number of blood red garnets which have a curious history. They came from Fort Defiance, Ariz., a locality that has produced some of the finest garnets in the world. Here they are associated with the olive green mineral peridot, which also, when fine, cuts into gems. The peridot pebbles are called by the natives, "Job's tears," the garnets are known as "rubies."

Ants as well as scorpions abound in the region, and their hills formed of the earthy material excavated in digging their subterranean homes, are numerous on the plains. The Indians—the Navajoes—and the soldiers from the fort go out among these hills, and upon their surface, mixed with other and worthless pebbles, they find scores of the stones—garnets and peridots. The jewels are gathered and sold at good prices to collectors and jewellers. Many thousand of dollars' worth of gems have thus reached the market.

Another interesting exhibit in the collection is the first sapphire ever found in the United States. It was discovered by Colonel Jencks in 1871, while the latter was mining for corundum at Franklin, Macon County, N.C. A quantity of the first particles of native gold found in California, a portion of that discovered by pioneer John Marshall on July 19 and 20, 1849, at Sutter's Mill, is also shown.

In the collection is some olivine peridot, the only precious stone which has ever been found in meteorites. The specimens are said to be from two fallen stars—one discovered at Glorietta Mountain, N.M., the other in Carrol County, Ky. A curious assortment of pearls is shown. They were found on the altar of an Indian mound in the Little Miami Valley. There were about two bushels, 50,000 in all. They had been damaged by fire, having been put on the altar by their savage owners during a sacrifice as a sort of burnt offering. With the pearls was found a fragment of meteoric iron, which is shown in the collection.

A few of the other interesting and beautiful things exhibited are four of the six ornaments found in the Indian mounds of Florida; an Indian arrow head, made from a beautiful fragment of smoky quartz, found in North Carolina, and an array of agates, malachites, topazes, beryls, diamonds, silver, tourmalines, and other native gems. The collection is in charge of George F. Kunz, the gem expert at Tiffany's.

Time.

UNDER the above heading the *Waltham Daily Tribune* has the following remarks:—Once more the watch factory correspondent feels that there is an opportunity to say something about those wonderful astronomical clocks, whose rate has been so close that it is deemed almost beyond reason, but nevertheless is a fact. The astronomical clocks were built at the factory about ten or twelve years ago, and there were four of them made—one for the United States signal service, which is at Washington, another for one of the college observatories, and the other two for the watch factory. A long time was taken in building them, and the best workmen in the factory put in months of fine labour in making these wonderful clocks as near absolutely correct and perfect in every detail, and no expense was spared in arriving at the result obtained. The clock that went to Washington, and was built expressly for the United Stated Government, had an electric winding mechanism attached to it, and the case was so constructed that the air could be pumped out, and the clock run in vacuum, as it was thought that the barometric changes would be overcome, and, as the electric winding apparatus served to keep it wound up without letting air into the case, it was run sometimes in complete vacuum. It was found, however, that a moisture or some foreign matter caused by electricity caused the polished steel parts in the clock to rust, and it was returned to Waltham, and the rusted parts re-polished, and the winding attachment changed from electricity to hand. It was returned to Washington, and placed on a solid granite foundation, which was set in the earth twelve or fifteen feet, so that it would be impossible to jar it, and every precaution was taken to overcome, as much as possible, the wave motions of the earth and changes of the barometer and thermometer. The result is, a clock is owned by the Government that runs within hundreds of a second of correct time in months; and columns in the great metropolitan papers have been utilised to show that it is the most wonderful clock on the face of the earth, and not a few persons who have watched the time ball drop, have had recalled to memory the fact that it is this wonderful clock from which the signal service take their time, and by it drop the ball precisely on the correct instant. What is true of the running of the Government clock is true of the other three clocks built at the same time, and the extreme variation of 2-10ths of a second in a number of months, a record made by one of the clocks at the factory, and its continual slight variation without being touched has caused astronomers to declare that it is the closest running clock in the world, and for a long time the Harvard astronomers had it connected with the observatory at Cambridge, so as to get absolutely correct time, but the telegraph line which was used exclusively for that purpose, was found to be so costly to keep in proper repair, that it was abandoned a few years ago, and Cambridge time taken instead of the watch factory time. All of the clocks built have shown the most remarkable running qualities, and as before stated have been acknowledged by home and foreign astronomers to be the best that the world has produced; but now comes what would seem to be almost incredible, and had the writer not taken special pains to watch the results that have been obtained by the other clocks at the factory he would be loth to believe that the feat was possible. First, the regulator in Foreman Hammond's office, which was simply an ordinary regulator keeping ordinary time, had attached to it one of the Lawrence patent pendulums, and the writer made notice of the fact in the watch words column at that time after it had been in use a month or two. The writer happened in Mr. Hammond's office and noticed that the second hand of the regulator compared precisely with the ticker, and was informed by Mr. Hammond that the same had been true for some time, there being no apparent variation between the running of the astronomical clocks and the regulator. Later, when it became necessary to move Mr. Hammond's finishers and adjusters to the room near the treasurer's office, and his old room was besieged by carpenters, pipers and painters, who put the vacated room into condition to receive Murray's hands, who now occupy it. The regulator was left undisturbed, as the extreme variation for the month was being noted and a record made of it daily by Mr. Bates, who has charge of the astronomical observations at the factory. In spite of the hammering by the carpenters, the jar attendant upon taking down and putting up benches, the jar caused by the painters who worked all around it, the clock was found to have varied so slightly that the second hand and ticker seemed to be precisely together, and the reporter had to place his ear to the clock case, to listen for the tick of the clock, as compared to the tick of the ticker, to notice the least variation, and it was so slight that it could barely be distinguished.

The wonderful running of that regulator, compared with the astronomical clocks with a world-wide reputation, seemed to the writer to be more of a matter of chance than a result actually obtained, and a still further watch was kept of the regulator after it was moved into Mr. Hammond's new office, and then the reporter became convinced that it was not chance, but a living fact, that the regulator ran so closely with the big clocks that the only way to find out what the variation was, would be to listen for the tick and ticker. As might be supposed, the writer came to the conclusion that the regulator must be a much better movement than it had ever been given credit for, and no doubt that idea would have always existed in the mind of the *Tribune* man had it not been for the fact that about six weeks or two months ago an ordinary watchmaker's regulator was set up in the janitor's office, and a Lawrence patent pendulum attached to it, as the company's experience had led it to believe that almost absolutely correct time could be gained by the use of said pendulum. The clock in question cost but 36 dols. at wholesale, and are made in Connecticut, and although they are neatly cased, and are really ornamental in appearance, it was not believed that any fine result could be obtained from such cheap works, as the case must have cost more than the movement, but this is the result, as the watch-making experts can testify. The clock has run for weeks at a time without a second's variation, and now that it is regulated down fine, the case door has been opened but twice in in two weeks, and then simply for the purpose of winding, and yesterday the tick of this common clock and the tick of the astronomical clock were identical, and had been so for the period of a fortnight or more, and the claim now made for the company by the writer, is that it has four clocks running so near absosolutely correct that either of them would do the fine work required, were the other three put out of service. The writer is informed by the experts in watch matters at the factory that this result would seem to them a year ago to have been impossible, but now that it is an established fact, and the Lawrence pendulum is doing just as good work in other places, it seems as though the days of fine running clocks had reached the millenium, and that there will be no further need of the time ball service in the cities, for every watch dealer can have correct time at a very small expense.

Watches: Another Revival.

AN English-made lever watch used to be considered the best and most endurable time-keeper, and was renowned throughout the world. The prices were generally high as compared with foreign productions, such as Swiss (Genevas), but they would last a life-time, and were often handed down from father to son, under proper care and usage. The introduction of machinery into the manufacture of watches, and the perfection and minuteness to which it has attained, especially in the United States, has revolutionized the trade, and English-made watches, like home woven silk, have had to retire into the background for a time; and within recent years some millions of cheap machine-made watches have flooded our shops and found their way into the pockets of our people, to the exclusion of our own higher-priced goods. We believe that the vast majority of those who purchased those "cheap and nasty" watches, tempted by the low price (from 10s. upwards) and the glowing advertisements and other inducements, but to whom correct time is an important item in their lives, have found out that the "cheap article is the worst economy," and they are harking back to the good old English-made watch. This being so, we are glad to hear that watch-making is being revived at Prescot, near Liverpool. The best and most reliable watches in the world are still made in England, at Clerkenwell, London; but these are also the most expensive, and are beyond the reach of the masses. Let the Prescot men produce the old style of English lever; let everything inside and outside be English-made, sound, and strong, and not cheap machine-made appliances from America or elsewhere fitted into English cases. Their progress in re-establishing the trade may be slow, but we think success is certain. The country is surfeited with these low-priced but really dear articles of foreign production.—*Manchester City News.*

American Novelties in Jewellery and Silver Ware.

THE *New York Jeweler's Weekly* gives the following paragraphs on the above named subject:—

An exceedingly pretty scarf pin represents a bright gold windmill with a platinum band around the roof and with the sails studded alternately with diamonds and rubies.

Etched pansies with the centres in relief form a pretty decoration for a coffee service.

Delicate and attractive is a bonbon box of open lacework in gold, which allows the contents to be seen from the exterior of the box.

Cat-tails, entwined with grasses of variegated gold, constitute a lace pin that shows the result of artistic design and skilled workmanship.

An oxydized silver horse shoe nail twisted into a knot, in the centre of which rests a tourmaline within bright gold claws, forms a unique scarf pin.

The pieces of a tea service produced recently are ornamented around the top with a band of etching, while the remainder is but a series of deep indentations.

Three balls—the emblem of the pawnbroker—each of different coloured gold, form a scarf pin that will command attention from lovers of the unique.

Ragged edges and ancient looks make the most recent silver fruit dish conspicuous. Two apples on a branch, with leaves, rise in relief from the bottom of the gold interior of the dish.

Gold and platinum leaves resting around the edge of a comma of alternate diamonds and sapphires, with variegated gold pansies, make a hair-pin that cannot fail to be received with favour.

Moonstone cuff links, representing ordinary mother-of-pearl shirt buttons, are an innovation. Gold threads cross the buttons, their ends being inserted in the four holes usually seen in buttons add to the effect.

A moonstone cupid bowing roguishly in the curve of a crescent of brilliants deserves more than passing notice as a lace pin. Around the throat of the little god a necklace of rose diamonds and small rubies is shown, terminating in a star of similar stones.

Somewhat massive, yet very artistic, is an elaborate silver cake dish of American workmanship. Three hippopotami plunging among tall water grasses and held under control by a small figure representing an Egyptian boy constitute the group at one end of the piece. The dish proper is formed in imitation of a Red Sea fishing boat.

THE DIAMOND "RING."—The action of the De Beers Diamond Company in limiting the output of diamonds to raise prices has made things bad for many of the Dutch diamond-cutters, who may be aptly described as "*stone* broke." But after cutting their work all their days, what can they expect?—*Funny Folks.*

The Story of a Watch.

AS TOLD BY ITSELF.

THE following article, although written in the light and humorous vein that characterises such transatlantic productions, contains some moral points which will not be lost on our horological readers; it is taken from the New York *Jewelers' Weekly* :—

I was made in London about the year Queen Victoria was born, at an establishment where the proprietor had a theoretical and practical knowledge of the business, and every workman had to be a complete master of the branch of business he professed. The caliper from which I was made was one of the best, all my different parts were arranged with a view to general utility, combined with strength where strength was required. I had no patent improvement whatever, and contained no complex arrangement to counteract the evil effects of faults that had no business to exist. To sum up my various properties, I was a sound, well-made lever watch, adjusted to positions and moderate changes of temperature, had heavy gold cases, and cost £30. My owner used me well, and was regular in his habits, and every eighteen months or so left me at the shop where I was made, to be cleaned and looked over. The watchmaker charged his own price for his trouble, and my owner paid it cheerfully; and for several years the most perfect satisfaction prevailed among all concerned.

One evening, after my owner had wound and placed me in the usual position for the night, he remarked to his wife what an excellent watch I was; that I had never failed to do my duty, or in a single instance led him astray since he had received me as a marriage present fifteen years ago; and that I was the best watch that was ever made, and that he would not part with me for a £100. Little did he suspect, when he made that remark, how soon he was to lose me; and as little did I think, while basking in the sunshine of his praises, what terrible adversity was in store for me. Early next morning, as my hands were between 1 and 2 o'clock, a man, wearing a mask, cautiously opened the door of the room, and I saw at once that his visit meant mischief. After glancing hurriedly around he came to the dressing table, took all the jewellery that was lying around, snatched me and my owner's wife's watch from our pockets, and took us, and some silver plate found in another part of the house, to quarters in London where stolen goods were received, and before the sun rose that morning my cases were a shapeless mass of gold, and my works locked up in a drawer with a quantity of miscellaneous movements of all grades, from the finest pocket chronometer to the cheapest class of Liverpool or Coventry duffers, and in a few days we were all packed together and sent to New York.

In New York I got new gold cases, and by some means was smuggled into the channels of legitimate trade, and was soon bought by a steamboat captain, who wanted a good, reliable, London-made watch. For over a year I gave my new owner the best of satisfaction; he was loud in his praises when he had occasion to talk about me, and once, when boasting about my regular running to a grain merchant, the proposal was made to purchase me. He said he had tried a great many different kinds of watches, and never could get one to run near as well as I was said to, and finally a bargain was concluded, and I was sold for more than twice my actual value. The grain dealer had occasion to travel considerably in the Western States, and somehow I could not run to please him any better than any of the watches he had carried previously.

He regulated me at every town he came to, and attributed my apparent variation to the shaking I had received when he was travelling. He certainly did travel over a great many rough roads, but I was able to stand it all without changing my rate very much—the real cause of the trouble was the difference of the time shown by what was acknowledged to be the standard clocks in the different towns and cities he visited; and when his watch did not show the same time as the clocks, he concluded the watch was wrong, and regulated it accordingly; and in this way he kept constantly shifting my hands and poking at my regulator.

Now, I do not think that a watch acts any worse than a human being when placed in a position of this kind. If a watch is constituted to pursue a certain line of conduct it cannot help doing so if people will only let it alone; but any unnecessary interference, however well meant it may be, always works mischief. I was doing my best to please him and could not do it; and he was under the pleasant delusion that he was helping me to run regular, while his actions were the very thing that prevented me from doing so. One evening he forgot to wind me, and, as a natural consequence, I stopped. He concluded at once that I needed cleaning, and took me to a watchmaker, remarking that he was to be sure and clean me well, as I had never run right since he got me. "Oh, yes," says the watchmaker, "I will shine it up good;" and he kept his word too, for the scrubbing he gave me with chalk and a hard brush was perfectly fearful, causing irreparable damage to my fine gilding. It was the first time chalk had ever been used to clean me, and the watchmaker left much of it in my pinions, pivot holes, and other places, and when he handed me back to my owner I was in a far worse condition than before I was cleaned. In the course of a very few weeks I stopped again, from being so choked up with chalk and hairs from the watchmaker's brush; and my owner took me to another watchmaker, who, of course, told him that I required cleaning.

My owner could not understand how it was that I required to be cleaned so soon, and evidently regarded this watchmaker as an impostor; but as there was no other in the town, and I had to be made to run somehow, he left me with him. Now, this watchmaker treated me very well; cleaned out all the particles of chalk, polished my pivots, arranged my screws in their proper places, and also polished and blued the heads of those that were damaged, and, as far as he was able, restored me to my original condition. When my owner called to get me, and when the bill was presented to him, he flew into a great passion; and instead of only thinking this really honest watchmaker to be an impostor, he now believed him to be one in reality, because he was charging 3 dols. for what my owner considered to be the same work as the man who had "shined me up good" had done so expeditiously, and charged only 1 dol. 50 cents. If the watch wearing public only knew a little more about their watches, how much better and pleasanter it would be for all concerned.

After this double cleaning the natural inference would be that I would be sure to run well; but I did not please my owner any better, and the primary cause of the whole trouble was, he kept continually altering the position of my hands and regulator. At last he came across a watchmaker in a large city who thoroughly understood what was the matter. He said that I was not properly compensated for heat and cold, which was invariably the disease that afflicted every watch that came into his hands. Now, this was the most scientific man that had ever handled me. He had an oven constructed according to his own ideas, and which differed from every other contrivance of the kind, for testing the rates of watches in various temperatures. His arrangement for producing cold was equally peculiar, and he was altogether so very scientific that he could use nothing but Reaumur's thermometer to mark the different degrees of heat and cold. I was first put through the stereotyped process of cleaning, but the owner of the establishment did not attend to that personally, leaving it to be executed by a subordinate. After I had been cleaned, and when he was putting me together, he bent one of my third wheel pivots slightly, and it was with some difficulty that I managed to keep moving.

To persons possessed of minds of such high scientific order as the owner of this establishment, the train of a watch is of little consequence; it is in the adjustments where all the science comes in; consequently he saved all his energies to use in that direction. Now, the ordinary adjusters of watches to heat and cold are content if they can get us to run regularly in moderate changes of temperature; but this idea would not satisfy the man whose clutches I had now got into. He argued that if a rope had to sustain 100 pounds weight, it would be safer to have it made to bear the strain of 200 pounds, which, of course, is agreeable to common sense as well as science: and consequently it must also be safer for a watch that usually runs in a given number of degrees of heat or cold to be tested in double that number. This also appears common sense, but it was not the science practised by my maker, who for extreme degrees of temperature considered a secondary compensation was necessary. This little omission, however, was of no consequence whatever to the professor who now had me under his charge. He tried me in a temperature below the freezing point, and then in another temperature which nearly melted the shellac that held the jewels in my pallets, and in this manner continued to persecute me for nearly a month; but being originally a good watch I was able to stand it all, and was not much the worse. At last this professor of baking and freezing examined his book, added up the figures in the different columns of the page devoted to my record, and I was pronounced to be perfect. My owner cheerfully paid the large bill that had been incurred, and it was considered morally certain that I would run regular this time.

How little dependence is to be placed on human calculations! Our fondest hopes, which to-day seemed on the point of being fully realised, are to-morrow shattered to pieces. The clocks in the towns of the different States that my owner visited in the course of his business still continued to show different time, and of course I was still considered to be running in proportion to the amount I varied from the different clocks. Besides, I had a bent third wheel pivot now, which sometimes caused me to stop altogether. In the course of a year I was at half-a-dozen different watchmakers, who all said that I needed to be cleaned, and they all cleaned me; but I was not fortunate enough to fall into the hands of one to examine me thoroughly to see really what was the cause of my stopping. One day I stopped after being only two days out of the watchmaker's hands. My owner tried another watchmaker in a town a number of miles distant, who told him the usual story, that I needed to be cleaned; but my owner maintained it could not be possible, as I had been cleaned but two days before. This man wanted a job, and was not particular about the means he used to get it, and, under the pretence of examining me and trying the power that was on my different wheels, with the point of a peg dexterously removed a portion of the dirt from under the nail of his thumb, and showed it to my owner as having been taken out of my works. Of course this was conclusive proof that I needed cleaning, and I was put through the process once more; but my third wheel pivot was not straightened that time either, and of course, I continued to stop running at intervals. My owner was now thoroughly disgusted with both me and the watchmakers, but was induced to try another one, who was recommended by a particular friend as being a mechanical genius.

This individual belonged to the family of "born watchmakers," and was one of those few who are possessed with that amount of knowledge of watches, and skill in correcting their errors, that only those inspired by nature can be expected to enjoy. He conversed freely about watches in general, and was very severe in his denunciations of regular watchmakers in particular. When my owner handed me to him, and told the whole story of my bad behaviour, the natural genius looked at me patronisingly, poked my wheels with the point of a piece of wire, quite regardless as to whether he was scratching them or not, then became absorbed in deep meditation for a few minutes. At last he pronounced that my gears (as he called them) did not run deep enough into each other, and that they had too much back lash.

My owner was astonished to hear of such a radical defect in my construction, and appeared a little incredulous at first, for he naturally wondered why the regular watchmakers had not discovered this defect before; but the natural watchmaker clinched his argument by giving him the piece of wire and the eye glass to try for himself; and sure enough there was a play or shake between the teeth of my wheels and the leaves of my pinions, and the born watchmaker convinced him that this shake prevented the wheels from acting constantly on each other. When the watch was being carried about, and especially if he was wearing it while riding on horseback, or in a railroad car, the play in the gears was sure to allow the wheels to move backward and forward, and consequently they could not move regularly, and when the wheels did not run regularly how could the watch be expected to run regularly? My owner soon saw the point of this sensible argument, and when he made the discovery he became perfectly frantic with joy, and nearly made himself as conspicuous in the neighbourhood as that ancient philosopher did, who, regardless of ordinary toilet arrangements, ran through the streets of his town shouting "Eureka."

Of course it was immediately decided that my wheels were to be made to run deeper into each other; the natural watchmaker was empowered to do the work, and in a few days the vandalism was completed. My destroyer first proposed to hammer my wheels and stretch them enough to prevent shake in the teeth, but finally abandoned that idea and bushed up the pivot holes and run the wheels in anew. My frames were fearfully abused in this operation; not one of my pivot holes were straight or properly fitted, and not one of my wheels was upright, but the wheels all worked as deep into the pinions as they could possibly be made to run, and my owner superintended the alteration in person. After this alteration was completed another one was found to be necessary. My mainspring was too weak, and a stronger one had to be put in, which was so thick that the mainspring box could not hold the usual number of turns and give the necessary freedom for the spring to work. The accurate adjustment of the fusee was entirely destoyed, but this defect was never thought to be of any consequence. At last I was put together, but it was awful hard work for me to keep moving, and were it not for the wide pivot holes I never would have been able to run at all. The points of the teeth of my wheels butted against the backs of the leaves of my pinions; the bent third wheel pivot, which in reality was the original cause of my stopping, was never observed, and was bent still; but the wide pivot holes accommodated in a certain degree all these defects. I managed to keep moving, and went regular enough to please my owner, who was now settled in one place, and compared me with one clock all the time. Although I was not going one-half as regular as before, he firmly believed that my construction had been greatly improved, and that another laurel had been added to the many already won by this natural watchmaker.

I have already related how I fell into the hands of a "natural watchmaker," and how he altered all my meshes, and ran them so deep that there was no shake between the teeth of the wheels and the leaves of the pinions, and I have also told that afterward a much stronger mainspring was necessary to make me run in this new condition, and how the strong mainspring broke my chain so often, which caused so much trouble and brought me into deeper disgrace. Now my depths, before this alteration, were as good as could be made. After twenty-five years of constant use they showed no signs of wear whatever, which was about as good proof as could be had that my pinions were well sized, the leaves well shaped, and also that the teeth of the wheels were of the proper form and acted at a suitable depth on the leaves of the pinions. Of course there was a little shake between them, which was both proper and necessary; but at one time this natural genius who repaired me had something to do with some special kind of mechanism where play in the teeth of the wheels was undesirable for the purposes the mechanism was used for, and he thought that the "back lash" in the teeth of my wheels was a serious error, and that I had been made by workmen that did not know any better, and convinced my owner that this was the cause of all the irregularities that he complained of.

My owner still thought that my construction had been greatly improved by this natural watchmaker, but he was dissatisfied with me on account of my chain breaking so often, and the natural watchmaker, to get rid of this difficulty, proposed to do away with my fusee and substitute a going barrel in its place. He said that the fusee watches were played out now, anyway; and, after complimenting my fine strong works, he said that all that was now necessary to make me a reliable watch was to put in a going barrel, and he brought out a copy of a jeweller and watchmaker's paper, which had something in it that supported his opinion. My owner consented to this proposal of taking out my fusee, and I was left to have the alterations made; but fortunately the genius was busy with other work and could not find time to do it while my owner remained in the place, and he concluded to give me another trial as I was.

On a certain occasion my owner was sojourning in a town in Northern Ohio, that bears the name of the author of the Declaration of Independence, where he was introduced to a watchmaker who had the reputation of being a very intelligent gentleman, as well as a skilful mechanic, which, in reality, he was. I was shown to him, and my owner related all the trouble he had to get me to run regular. "Oh," said he, "I see what is the matter; the pivot holes all require to be inchased." And he easily persuaded my owner to have this done, telling him of what lasting benefit it would be to me. Now, this man had recently purchased a new Universal lathe, which at that time was his special hobby, and every watch that was brought to him had either to have the pivot holes inchased or some other work done to it that required the use of the new lathe. Even if only a glass was to be fitted the bezel had to be put in the Universal lathe and the groove undercut. I got my pivot holes inchased, and, although I was not in any way damaged, the real cause of my irregularities was never looked into, and, practically, I was no better than before. My owner, however, had received a vast amount of information on every conceivable subject on which he chose to "start a sliver," and went away well pleased with himself and everybody else, and with the assurance that he was possessed of an excellent watch which was now in perfect order.

One day my owner was in New York city, and he took me to a place where they advised a new chain to be put in, and as large and as thick a one as my fusee would admit of was selected and put on, and after this I continued to run for quite a long time without it breaking; but my running gave my owner no better satisfaction, for the clocks in the different towns which he visited still continued to show different time from each other, and if by accident my hands agreed with one clock it was sure to vary with the next, and I got the blame of running irregular, and was regulated accordingly. During his travels my owner met with a watchmaker who said that I was not adjusted to positions; that if I was only adjusted to positions I could not help but run regular for ever after. Now this was exactly what my owner wanted, so I was adjusted to positions. The plan of obtaining this adjustment was one that is followed by some watchmakers in London, and it consisted of turning away a part of my balance staff pivot at the ends nearest to the shoulder, so that there would be a less amount of the surface of my pivots bearing upon the jewels. I do not know whether this alteration would have had the anticipated effect or not, for the very same day that my owner got me back he was jumping off his wagon and the sudden shake, which never before used to do me any harm, broke both of my altered balance staff pivots; and my beautiful balance staff, so artistically made in every particular, was replaced by another watchmaker with a piece of round steel with pivots that looked like long centres on each end of it. In this condition I continued to run, but much worse than I ever did before; and at length my owner came to the town where the "natural watchmaker" resided, and I was again submitted to his tender mercies. He had made a new discovery since my owner was there before, which he was now practising with great success. With reference to my fusee he admitted that so long as my chain was not breaking, the fusee did no harm, but he said that my "*eyesockerizm*" was in a bad condition; that I would have to be "*eyesockerized,*" and then everything would be right. To make a long story short, my beautiful, hardened and tempered balance spring, that had its curves formed with the greatest possible amount of skill, so as to cause the long and short vibrations of the balance to be made in the same length of time, was bent and twisted about by this wretch most fearfully, and I was handed back to my owner with my balance spring completely ruined, and he cheerfully paid a large price for the supposed improvement.

In a month or so after this I stopped one day, and my next experience was with a watchmaker who said that my pivot holes were all too wide, and that I needed a new balance staff, which was all true enough; but as regarded my pivot holes, he did not take the state of the depths into consideration, and although the pivot holes had been undesignedly left so wide by the "natural watchmaker," they helped me very much to run when my depths were so deep. It was very difficult to persuade my owner that these faults were in me, for he had the greatest amount of confidence in the workmanship of the "natural watchmaker" who had made some of the alterations. But after he had been shown the wide condition of the pivot holes, he finally empowered the watchmaker to make whatever alteration he considered to be necessary to make me run well. Now, this watchmaker put a very good new balance staff in me, and he also brushed the pivot holes, and the workmanship was very good. The pivot holes were all nicely polished, and my bent third wheel, which had been in that condition ever since I had been cleaned preparatory to being compensated for heat and cold, was made straight. The pivot holes were very accurately fitted to the pivots, which were nicely polished, and particular attention was paid to making good countersinks to hold the oil. However, when I was set running again, the tightness of my pivot holes neutralised all the good effects of the fine workmanship, and I stopped running easier than ever I did before. My owner was again disappointed, and became thoroughly disgusted. I had cost him a large sum of money in the first instance, and he had paid nearly as much more to watchmakers for cleaning and repairing, and now, having lost all hope that I could ever be made to run well, he sold me to a peddler for a mere trifle. This peddler sold me to a second-hand dealer in New York city, and I, who used to be so much praised for my good running, and considered so reliable and trustworthy previous to being bought by my late owner, was now, from no fault of my own, completely discarded and laid aside as worthless.

After I had been in the second-hand store for a number of months, an old Englishman called one day to buy some second-hand watches. He took me up and looked at me; took me out of my case, took off my hands and dial, when he saw some private marks on my frame which showed that I was a watch that he had a hand in making when he was a young man. He immediately bought me, took me home, and at his leisure hours restored me as near to my original condition as it was possible to do, and now I can run again without the least effort on my part, and as well as the majority of the best of watches. My troubles are nearly over now, but there is one dread still haunts me that I was unconscious of in my early life, and that dread is watchmakers. I am about as much afraid of falling into the hands of those workmen that are possessed of only a little knowledge, which is often so dangerous, as I am of those "born watchmakers" who have been especially endowed by nature. A watch is always improved by passing through the hands of a careful and thorough workman. He often detects little faults which, although they may have no immediate influence on the running of the watch, his critically-educated eye cannot allow to pass, and they are corrected, the customer being simply charged for ordinary cleaning; but a man who is full of whims concerning pivots and bushes, pitchings, escapements, etc., which have no foundation in natural philosophy, is the most dangerous of persons to repair a watch. If the watch-wearing public could only be made to understand that their watches are made much worse for passing through the hands of careless and ignorant workmen, although they may by chance run well for a time after, than they are from the ordinary wear of a life-time, I will not consider this narrative of my life and sufferings has been written in vain.—*Jewelers' Weekly.*

On the 20th ult., the Dumbartonshire police apprehended a man named John Currie as he was being liberated from Glasgow Prison, where he had undergone a term of imprisonment for the theft of two watches. The charge preferred against accused on this occasion was the theft of a silver watch from his employer, Mr. Gillespie, watchmaker, Clydebank, in the month of January of last year. Accused pleaded guilty, and it having been stated that the conviction was sought in order that the watch might be recovered from the pawnbroker, the Sheriff passed sentence of another three days' imprisonment.

The Aneroid Barometer:

Its Various Forms, its Theory and its Use, with Special Reference to the Determination of Altitudes.

By E. A. Gieseler, C.E.

Communicated to the "Journal of the Franklin Institute."

V. THE DETERMINATION OF DIFFERENCES OF ALTITUDE BY MEANS OF THE ANEROID BAROMETER.

THE measuring of altitudes by means of the barometer is mainly based on two suppositions, viz.: Firstly, that the atmospheric strata of equal pressure are horizontal, and secondly, that the temperature of a vertical column of air is equal to the arithmetical mean of the temperature observed at its top and at its bottom.

These two conditions are probably *never* fulfilled completely in nature, but they are *always* fulfilled more or less approximately. On the greater or smaller deviation from them of the actually existing condition depends the exactitude of the result in each case, leaving out the consideration, of course, of avoidable errors of observations.

In accordance with the two principles mentioned, the process of barometric measurement may be described thus: By means of the barometer, be it a mercurial or be it an aneroid, the *weight* of a column of air is determined, and from the *observed temperature* of such column its length is found.

During observations for altitude, therefore, the temperature of the *air*, as well as that of the *instrument*, must be observed; the first one for the purpose named just now, the last one for the purpose of taking into proper account the corrections for temperature, by reducing both observations to uniform temperature. Besides this, the observations made at the upper and at the lower stations must, of course, be corrected to graduation, so that thus their difference is made equal, as nearly as possible, to the difference that would have been obtained by using a mercurial barometer.

It is clear at once that the observations at the upper and lower stations should be made simultaneously, in order to obtain both as nearly as possible under the same atmospheric conditions. Observations made by one observer, in passing from point to point with his instrument, are quite unreliable, unless he returns to the previous point after each observation, in order to take a second reading there, and thus to find the changes that have taken place in pressure and temperature. Only by means of this tedious and time-robbing procedure can anything like fair results be obtained by one observer.

For serious work, then, two observers, and at least two instruments, are required, and the readings of the latter, as well as the outer and inner temperature, should be recorded with great exactitude, so as to be enabled to subsequently introduce the proper corrections, without which the results are worthless. Great care should be taken not to expose the aneroid to the direct rays of the sun when taking an observation, but to let it assume as nearly as possible the temperature of the surrounding air in the shadow.

The *modus operandi* in determining differences of altitude may be described about as follows:—

A stationary instrument, with an observer, is placed at some point of known altitude that has been selected as the basis of operations. This instrument is observed regularly every fifteen or thirty minutes, and a careful record kept of such readings, as well as of the time and temperature corresponding to each.

Meanwhile, the engineer travels through the district he intends to survey, taking observations wherever he sees fit, and keeping a careful record of their location, time, temperature, etc. When he is through with his work, an observation at the point of known altitude is computed for each of his observations, from the record kept by the assistant; this having been done, the difference of altitude between each point of observation and the point of known altitude is obtained in a simple way, by means of the subjoined table No. 1, which has been taken from *Meteorological and Physical Tables of the Smithsonian Institution.* [Other convenient tables are given in *The Aneroid Barometer*, Van Nostrand, New York, 1888, and in the above-mentioned publication of the Smithsonian Institution.]

For instance, suppose 29·5 to have been the reading at the point of known altitude, and 26·5 the reading taken by the engineer, both corrected to graduation, etc., and reduced to 32° F., and again, suppose 70° and 60° to have been the respective temperatures of the surrounding air, then we obtain from the table:

For 29·5 inches and 70° F.	96·5
For 26·5 inches and 60° F.	105·3
Mean	100·9

This mean, multiplied by the difference of the two readings expressed in tenths of an inch, renders the difference in altitude:

30 × 100·9 = 3,027 ft.

The use of this table gives results of sufficient accuracy for all practical purposes, so that recourse to the complicated barometrical formula is not required.

Readings should always be taken in the same position of instrument, preferably the horizontal one.

TABLE No. 1.

HEIGHT IN FEET OF A COLUMN OF AIR CORRESPONDING TO ONE-TENTH OF AN INCH IN THE BAROMETER.

Barometer Reading in inches.	Temperature of Air in Degrees Fahrenheit.					
	40°	50°	60°	70°	80	90°
23·0	116·2	118·8	121·3	123·8	126·4	129·9
23·5	113·7	116·2	118·7	121·2	123·7	126·1
24·0	111·3	113·8	116·2	118·6	121·1	123·5
24·5	109·1	111·5	113·8	116·2	118·6	121·0
25·0	106·9	109·3	111·6	113·9	116·3	118·6
25·5	104·8	107·1	109·3	111·6	113·9	116·2
26·0	102·7	105·0	107·2	109·5	111·7	114·0
26·5	100·9	103·1	105·3	107·5	109·7	111·8
27·0	99·0	101·2	103·3	105·5	107·6	109·8
27·5	97·2	99·3	101·4	103·5	105·6	107·8
28·0	95·4	97·5	99·6	101·7	103·8	105·9
28·5	93·8	95·8	97·9	99·9	101·9	103·9
29·0	92·1	94·1	96·2	98·2	100·2	102·2
29·5	90·6	92·6	94·5	96·5	98·5	100·4
30·0	89·1	91·0	92·9	94·9	96·8	98·8
30·5	87·6	89·5	91·4	93·3	95·2	97·2

TABLE No. 2.

REDUCTION OF MERCURIAL COLUMN TO 32° F., BRASS SCALE TO BAROMETERS CORRECT AT 62° F.

Temperature	Reading of Barometer.		
	30 inches.	25 inches.	20 inches.
32°	·009	·008	·006
35°	·017	·015	·012
40°	·031	·026	·021
45°	·044	·037	·030
50°	·058	·048	·038
55°	·071	·059	·047
60°	·084	·070	·056
65°	·098	·082	·065
70°	·111	·093	·074
75°	·125	·104	·083
80°	·138	·115	·092
85°	·151	·126	·101
90°	·164	·137	·110
95°	·178	·148	·118
100°	·191	·159	·127

The corrections contained in this table have to be *subtracted* from the reading of the mercurial barometer, in order to reduce the same to a temperature of 32° F.

Colonial Jewellery.

AT the present time, says the *Melbourne Age*, when there has been considerable debate in certain quarters as to the quality of the work produced by colonial manufacturing jewellers, it is of interest to note any extension of this branch of local industry. Messrs. Hannemann and Towns have opened a new establishment in the old premises of Massina and Co., at 279, Little Collins Street, where unbelievers can see the manufacture of the best kinds of jeweller's work finished equal to any in Paris or London. In the warehouse, fitted up with glass cases and large iron safes, you see gold racing cups, gold mounted whips, silver cups of all kinds, and ruby, pearl and emerald rings and pins. But the speciality here is diamond work, such as tiaras, sprays, stars, pendants and necklets. All the best kind of diamond work is artistically set in silver and backed with gold. As Messrs. Hannemann and Towns are manufacturers for the trade, the destination of many of these costly articles is unknown. The most expensive piece of diamond work ever turned out in the colonies, just finished at this factory, may possibly figure on some fair lady's neck as a Parisian production. Every detail of the goldsmith's and jeweller's art can be seen here. The initial process is in the melting and finishing room, which is fitted up with large smelting furnaces. Here you see ingot moulds and plate mould of all sizes, in which the gold is cast. The precious metal is received in the raw state, and then made workable by smelting and refining, and afterwards alloyed to the different standards used—from 15 to 22 carats. It is then rolled in different mills to the various sizes required by the jeweller. There are other rolling mills in the workshop, with polishing lathes, wire mills and draw benches. At these and at various vices workmen, young and old, are seated making various articles of jewellery, from a simple brooch pin to a highly artistic diamond spray. The older workmen are the best skilled mechanics of the old country, the younger have served their apprenticeship in Australia, but in powers of execution are no whit behind their elder shopmates. Messrs. Hannemann and Towns show designs and executed orders in diamond work of the most elegant kind. Yet Australian workmanship should call for the exercise of Australian art, and it is to be hoped that in time our wealthy dames will be proud to wear colonial work of colonial design instead of imported, or colonial work passed off by them as Parisian.

Hit the Nail on the Head.

SAYS the Toronto *Trader*, in reference to our leaderette in December's issue :—"The London, England, *Jeweller and Silversmith* pretty nearly hit the nail on the head when it attributes the loss of England's trade with Canada in jewellery to the "want of adaptability on the part of English manufacturers to meet the demand of colonial taste." The English manufacturer has always had the idea, or if they thought otherwise they have taken very good care to keep their thoughts to themselves, that English taste was unapproachable, and that what was in fashion in England was good enough for colonists. While this worked well enough as long as England had a virtual monopoly of the jewellery trade, it had to go under just as soon as competitors arose who could not only manufacture almost as cheaply, but were willing to cater to the vitiated taste of these so-called colonists. Merchants in Canada have always had an idea that a man who gets goods made for him and is ready to pay the cash for them, should have some small say regarding their style, etc. Of course when the English manufacturer refused to see it in the same light, and practically told him that he must either take what he had to sell him or look elsewhere for other goods, the "colonist" took his advice just as soon as he could find some one who was willing and able to cater to his wants. In our opinion, had the English jewellery manufacturers shown the same enterprise and desire to please their customers that their American and Canadian competitors have displayed, they could, with their plentiful supply of cheap skilled labour, not only have held their own in the colonial markets, but largely increased instead of diminished their trade. They have lost ground almost entirely on account of their own want of foresight, and, like every other business, they will find that it is very much easier to drive away trade than to regain it once that it is done."

[If our readers will refer to the article in question, from which our esteemed contemporary quotes, they will see that we suggested the "want of adaptability" on the part of home manufacturers only as a suppostitious alternative cause for a falling off in or standing still of our trade with Canada ; the other cause, and the chief one, being "failure on the part of English manufacturers to keep the Colonials informed of what they were doing, and of so educating the Colonial taste up to the home standard . . . . of keeping English styles in the front place in Colonial markets *by judicious advertisement*," etc.—Editor, *Watchmaker, Jeweller, and Silversmith.*

Practical Vision-Testing.

By R. Brudenell Carter, F.R.C.S.

A Paper read before the Society of Arts.

THE suggestion that I should bring before the Society of Arts a paper on "Practical Vision-Testing," arose from the familiar fact that there are many industries in which good vision is essential, not merely to excellence of workmanship, but also the security of numerous persons who are dependent, as in the case of passengers in a train or in a steamship, upon the prompt recognition of signals by those whose duty it is to control the helm or the locomotive. On this account it has been found necessary, by railway directors, shipowners, and other employers, to establish tests for visions of various kinds, as conditions to be satisfied by those seeking to obtain or to retain employment in various capacities ; and this private action has been endorsed by that of the department of the Government which is entrusted with the supervision of locomotive facilities. The tests and examinations thus instituted have been modified from time to time, sometimes in accordance with increasing knowledge, and, sometimes it may be feared, as a result of ignorant submission to clamour. Of late, especially, we have heard a good deal to the effect that the tests and methods of employing them adopted by railway companies have become "unsatisfactory ;" and demands for alteration have been made, with threats that these demands would be supported by the machinery of a "strike," if the alterations asked for were not speedily carried into effect. The complaints have been based chiefly upon the following statements :—First, that the tests of form-vision and of colour-vision commonly employed are in themselves insufficient and misleading ; secondly, that their deficiencies have been intensified by their having been applied in an imperfect manner or by incompetent persons ; and, thirdly, that they have been used by foremen and others, for the purpose of improperly dismissing or reducing workmen against whom those so using them entertained a grudge. It is asserted that this latter object has been attained by calling upon the workmen to submit to vision tests when they were exhausted by labour, as, for example, in the case of an engine driver, when he had been for 17 hours upon the footplate.

It is obviously impossible for me, in such a paper as the present, even to consider how far such an allegation as that last mentioned may be founded in fact ; and I must be content with the endeavour to lay down, and, in the very imperfect way which time will allow, to explain, the principles on which trustworthy vision-testing, whether for form or colour, should be conducted. I may premise, however, that similar complaints have arisen in America, and that there they have been clearly traceable to the circumstance that the tests employed have been real and searching, and have actually excluded from certain kinds of occupation, persons who were manifestly unfit to engage in them. An engine driver, for example, with defective vision may, nevertheless, get through his work for a long period without accident, having acquired, perhaps, a certain skill in the interpretation of imperfectly seen appearances. Notwithstanding this skill, which does not admit of being estimated or valued, he is, nevertheless, an unsafe man, who by any trustworthy test would be removed ; and, if he remain in his employment, the probabilities are that some day his defect will find him out, and will lead to a disastrous accident. The determination of some of the American companies, and of some of the State Legislatures, to permit no risks of this kind, and to remove men who, although they had driven without accident, were, nevertheless, constantly liable to error, created much dissatisfaction in the States, and, in some of them, this dissatisfaction was used as a lever by one or other political party, who sought to obtain the votes of railway men by promising to agitate for an alteration in the laws by which the obnoxious tests were imposed.

It is intelligible enough to the student of human nature that every engine driver, although quite ready to admit that good vision is essential to his calling, would none the less be prepared to affirm that his own personal vision was at least good enough, and that any test which showed it to be deficient was misleading. There are some who would go farther still, and who appear to entertain very lax views with regard to the duties to the public which the pursuit of certain occupations would generally be held to entail. Not long ago a man with very bad eyes came to me at St. George's Hospital. His eyes were in such a state that he was not only nearly blind, but that shelter and treatment as an in-patient were necessary to his recovery. I told him that he must remain in the hospital, but to this he strenuously objected, on the ground that it was necessary for him to continue his work and to earn his living. On enquiring the nature of this work, I found that he was the driver of a hansom cab in London ; an occupation in which he could then only have been saved from collisions by the sagacity of his horse. I was sorry for the poor fellow, but recognised a duty to the public ; and told him that if he attempted to return to his driving seat, I should feel it right to communicate with the police. He yielded, and I had the satisfaction of sending him out cured ; but the case was a warning to me not to attach too much importance to a workman's own impression with regard to his physical fitness for any duty in which he might be anxious to engage. I am, therefore, prepared largely to discount some of the complaints to which I have referred ; and to believe that the accuracy and excellence of any given test may sometimes be a reason for fault-finding on the part of those who think that it presses upon them with undue severity.

I have received, since this paper was announced, a communication from a gentleman who has greatly interested himself in the subject, and who advised me to inquire as to the methods of testing which are in use upon some particular railway (I forget which), because, he said, they were satisfactory to the men. Now I wish to point out that, in order to be able to estimate the value of a vision test correctly, to know when and to what extent it is trustworthy, and in what circumstances it would be likely or certain to break down, it is necessary to be fairly well acquainted with both physical and physiological optics. The satisfaction of a railway man, I care not whether the chairman of the company or the driver of a shunting engine, would have no influence in rendering a deceptive test trustworthy, or in rendering a trustworthy test deceptive. The opinion which either might express would have no influence upon the instructed judgment of an expert. It is no doubt desirable that railway men should know that they are fairly dealt with ; but they must derive this satisfaction, if at all, at least on this question, from their confidence in the character and attainments of those by whom the examinations are conducted. It would be absolutely impossible, as a rule, for men following a laborious business to devote to the study of optics such an amount of time and attention as would be required in order to qualify them to act the part of critics. It is mainly for this reason, but also for many others, that even if routine portions of the examination are sometimes committed to a clerk or other such official, the men whose employment is at stake should always have an opportunity, in case of need, of appealing to the decision of a trained and thoroughly competent examiner. There is no particular charm in his being a doctor, for many doctors have never attempted to master the questions at issue ; but he should certainly be well acquainted with optics, and should be a person not only of intelligence but of high mental cultivation.

The vision which we are called upon to consider depends upon two perfectly distinct elements ; namely, the power of seeing the shape or outline of an object, and the power of seeing its colour. It is necessary to consider these apart from one another.

The eye is an instrument which bears a general resemblance to a photographer's camera, and which, like it, produces upon its background a reduced and inverted image of the visible objects towards which it is directed. But the background of the eye, instead of being of ground-glass, like that of the camera, is an infinitely fine mosaic composed of the terminations of sensitive nerve fibres, each of which is endowed with independent sensibility, and each of which conveys to the brain the impression produced upon it by that part of the general image which itself receives ; the brain then combining these separate impressions, or reports, as they may be called, into an effect upon the consciousness which is so interpreted as to afford information about the nature of the visible object. The sense of touch is less fine than that of the sight, but its mode of action is more familiar, and may serve to illustrate that of the former. If I place one finger-tip upon the surface of a coin, I shall feel that surface, and may perhaps recognise its metallic character. If I place the tips of five fingers upon the coin I shall, by combining the impressions which they receive, recognise its circular outline, its magnitude and thickness, and also something of the difference between its own surface and that upon which it rests. The consciousness hardly analyses the impressions received by the five fingers, and is hardly aware of their distinctness, but it combines them to form the basis of a single mental operation. In like manner, although the impression made upon each separate nerve-fibre forms the basis of the sense of vision, we have become habituated to combining these impressions without analysing them, although if we desire to understand how seeing is accomplished, it is the action of the single fibre to which our attention must in the first instance be directed. Now this action, disregarding colour, and for the present confining ourselves to form, is that some given nerve-fibre receives more or less light than those around it, and is impressed by the difference, which, in order to create the impression, must be of a certain amount. Each fibre, in an isolated condition, is circular in outline, but these circular outlines, when closely packed together, necessarily become hexagonal, and we may take this diagram as representing, on an enormously enlarged scale, the surface on which the visual image is received. It must be remembered that each nerve terminal is capable only of taking account of the difference between the amount of light which falls upon it and that which falls upon its neighbour, but that no nerve fibre can take account of differences of illumination which affect different parts of its own individual surface. Let us suppose that the object looked at is circular, say one of these dots, which furnishes, of course, a circular image upon the retina. If the image be so small as to fall wholly within the boundaries of a single hexagon, as at A, that nerve fibre alone will be affected. If it be large enough to transgress the limits of that hexagon, and to extend, in however slight a degree, upon the surrounding ones, they will all be affected like the central one, as at B.

Now the size of the retinal image depends upon two elements, the size of the object looked at and its distance, these two together regulating the dimensions of what is called the visual angle. Time will not permit me to go into details on this question, and I must be content to say that the retinal image of this spot, seen from a distance of fifty yards, would be precisely the same as that of this one, seen from a distance of twenty-five yards. It is clear that by altering the distance of the same object we may obtain from it an image which extends over several hexagons, or which is just contained within the limits of a single one, or which covers only one-third, or one-sixth, or any greater or less proportion of the area of a single one. Let us take a case in which the image is definitely smaller than a single hexagon, and let us suppose that the object which furnishes the image is either a dark spot, like one of these, or a bright spot, such as a fixed star. In the former case, the affected hexagon will receive less illumination than its neighbours, in the latter case it will receive more. Now it is evident that the amount of this difference must reach a certain degree before any given eye is able to recognise the presence of a dark or of a bright spot, as the case may be; and it is also evident that the degree may differ in different eyes, some having a greater or less degree of acuteness of light perception than others. We all know that as twilight passes into darkness stars suddenly become visible. There is no difference in the visibility of the star, or in the amount of light received from it; but, as that amount contrasts more and more strongly with the surrounding gloom, the difference between the hexagon which receives the star image and the surrounding hexagons becomes greater, and at last becomes great enough to be recognisable. In these circumstances, one person will see a particular star before it becomes visible to another. Arago met with a Siberian Tartar who was able, with the unaided eye, to see the third satellite of Jupiter, which has probably never been so seen by any European. This kind of seeing, however, is not a result or a measure of acuteness of vision, properly so called, but only acuteness of light perception, that is, of the power of recognising small differences in the quantity of light which is received on different parts of the retina, or upon different hexagons of its surface. In order to arrive at acuteness of vision, properly so called, we have to ascertain the power of the person tested to see separateness, to see, that is, whether a certain bright or dark object is single or multiple, composed of a single spot or of two or more spots. Now, in order to see the separateness of a group of spots at the greatest possible distance, or in order to count the number of which it is composed, it is requisite that the interval between each two of them should not be less than the diameter of the spots themselves, and then the image on the retina must be of such a size that the image of no single spot transgresses the limits of a single hexagon, the result of this being that the hexagon intervening between any two which are impressed remains unaffected, and so produces the impression of the clear interval which separates them. The moment the object is removed to so great a distance, in proportion to its size, that there is no longer an unaffected hexagon left between two spot images, that moment the two images become blended into a single one, and their distinctness can no longer be recognised by the eye. It is obvious that, the finer the retinal mosaic, the smaller the individual hexagons of which it is built up, the greater will be the distance at which the separateness of the individuals of a given group of spots will be discerned; and it is also obvious that this distance might also be increased by increasing the intervals between the spots themselves without increasing their diameter. It follows that the most accurate test of visual acuteness is obtained by using groups of spots, each one of which is separated from its neighbours by intervals equal to its own diameter. The distance from the observer, or person tested, at which the number of spots forming such a group could be distinctly recognised, would vary within uncertain limits with different people, and it has been found necessary, for practical purposes, to set up a standard which is fairly expressive of average human capacity. It would take me too long if I were to explain the theoretical considerations by which, as well as by practical observations, this standard has been arrived at, but I am able to place it before you. Its requirements are fulfilled when the spots which form this group are correctly counted at a distance of 50 metres, and when these are correctly counted at 25 metres, or these at 10, the magnitude of the retinal image being precisely the same in all three cases. It is understood, of course, that the trial should always be made in good daylight, and that the person tested should be so placed as not to be dazzled or hindered by the direction in which the light falls. Printed types of regulated sizes are much used for vision testing, and answer fairly well for many purposes, but they are inferior in the accuracy of the results which they afford, to those groups of spots, which correspond with the anatomical structure of the retina, and leave absolutely nothing to be desired. The dots used in the army are very imperfect contrivances, and the results which they afford are not trustworthy. They are of square shape, so that their square images easily transgress the hexagonal boundaries of a nerve fibre, and they are separated by uncertain and usually by too great distances, so that they are rendered more distinct than they should be, and differently distinct according to the distances between them.

The best mechanical arrangement for testing vision by groups of dots is to have a series of these groups placed in a circle near the margin of a revolving wheel, which again is placed behind a disc with a marginal aperture of such a size as to disclose only one group at a time. The person to be examined is placed at the proper distance, in proper light, and the disc is turned round; as each group of dots is disclosed the person tested should name the number of dots composing it, rapidly and without mistake. Whoever can do this has normal vision. He might not be able to see one of Jupiter's satellites, but he would see in all circumstances, everything which could be seen in the same circumstances by any ordinary person.

If the examinee should make mistakes the next step is to allow him gradually to approach the dots, until he reaches a distance at which his mistakes cease. The difference between the distance at which he ought to see and the distance at which he can see, permits the degree of acuteness of vision which he possesses to be stated in a fraction with absolute accuracy. If he ought to count the dots at fifty metres, and cannot until he comes to twenty-five, his vision is fifty divided by twenty-five, or exactly one half of what is normal. If he comes to thirty metres, his vision is three-fifths of the normal.

(To be continued.)

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

CONTINUING the further consideration of muscular defects, Dr. C. A. Bucklin, in the pages of a contemporary, says that grotesque positions of the head are very common results of muscular defects. The head is always turned in the direction which the paralyzed muscle formerly moved the eye. If both superior recti muscles are weak the tendency of both eyes is to droop. This difficulty is overcome by throwing the head backward. The following example illustrates this class of cases: The Rev. P. S. was undoubtedly an unpopular clergyman; he walked about with his head decidedly thrown backward, and upon meeting an acquaintance he threw his head with a spasmodic jerk still further back, the act of bowing simply bringing his head to its first position. This personal peculiarity was considered very generally as an evidence of cold affectation, when the truth was the man could not raise his eyes to the level of the face he wished to observe without throwing his head back. I cannot resist the conclusion that the general unpopularity of this clergyman was largely due to the defect of his ocular muscles.

Weakness of both inferior recti muscles requires the head to be thrown forward to overcome the defect. This gives to the individual an appearance of melancholic stupidity. The chin is carried down on the chest and with each attempt to observe closely the faces of friends, especially if they are seated, there is an additional movement of the head forward. I remember a young boy who worried his parents very greatly because they feared he was affected with some brain trouble which produced this appearance of mental depression. He had received all kinds of treatment for his apparent mental condition; among other forms of treatment he had received a thorough course of bromides. A weak pair of prisms, base down, combined with a positive assurance that the trouble was entirely due to trouble with his ocular muscles, quieted all uneasiness in the minds of the parents, and produced a very satisfactory result in the improved condition of the boy.

Paresis of one of the lateral recti muscles will cause the head to be turned toward the weak muscle, providing the advantages gained by this movement are sufficient to compensate for the annoyance experienced as a result of the weakened muscle.

Paresis of the superior oblique muscle alone is quite frequent, because this muscle has an independent nerve supply, while paresis of the inferior oblique is complicated by other muscles being involved in the paresis which have a common nerve supply with the inferior oblique.

Paresis of the right superior oblique muscle frequently causes an individual to carry his head turned slightly outward and downward in such a manner that the vertical axis of the eye is rotated slightly outward. The position of the head is characteristic, and the diagnosis of paresis of the superior oblique can be made as far away as the position of the head can be observed.

Paresis of the left superior oblique muscle produces exactly the opposite effect.

Diplopia.—When, by changing the position of the head in such a way as to avoid the use of the faulty muscle, the individual is not able to maintain binocular vision, we have diplopia or double vision.

One eye deviating from its usual position makes it impossible for the retinal image to fall on corresponding points of the retina; consequently each eye receives a retinal impression from the same objects on different points of the retina. This gives the brain the sensation of two objects located in entirely different positions. With the straight eye the object will appear in its true position; with the deviating eye the object will appear to be located where objects formerly were which cast an image on that portion of the retina now exposed to the retinal image.

The necessary deviation of the eye to produce diplopia is not sufficient to locate which one of the ocular muscles is the faulty one. We are therefore obliged to draw our conclusion from the relative position of the double images.

If we place a red glass before the right eye and direct the attention to a candle at twenty feet, and the red candle is to the left, we have *crossed diplopia*. This defect can only be produced by the deviation of one eye outward; consequently the fault lies in one of the internal muscles. The turning of the right eye outward would be the only movement which could bring the portions of the retina in the visual line upon which objects to the extreme left had formerly cast an image. The diplopia being crossed, one of the internal recti muscles must be paretic. The next question is to decide which one of the two is at fault. If on moving the candle several feet to the right of the patient, it is found that the lights come nearer together, the right internal rectus is the faulty one; this fact is especially pronounced if on moving the candle towards the left eye the lights appear to separate more widely. Should the lights, on the other hand, approach each other when the candle is carried to the left, then the left internal rectus is the faulty muscle.

If, when the red glass is placed before the right eye, the red light appears to the right, then we have *homonymous diplopia*. To produce this phenomenon, one eye must deviate inward; consequently one of the external muscles must be affected. If, on carrying the candle to the right, the lights approach each other, the left external rectus must be the faulty muscle. If, on carrying the candle to the left, the lights approach, the right external muscle must be the faulty one.

Vertical diplopia exists when the double images are seen to stand squarely over each other. The difficulty, when slight, is difficult to locate, as a defect in the superior rectus of one eye produces exactly the same results as a defect in the inferior rectus of the opposite eye. However, if a candle be observed at about the same height from the floor as the eye which with one eye during the binocular visual act appears in its normal position while the image in the other eye appears decidedly displaced above or below, a fair conclusion may be drawn as to which eye has the defective vertical muscle. Diplopia due to paresis of one of the oblique muscles gives a certain slanting position to one of the visual images, which is never present as a result of paralysis of one of the direct ocular muscles.

Diplopia is usually due to a partial or complete paralysis of one of the ocular muscles which control the relative positions of the visual axis. It may be due to some error of refraction, which, notwithstanding normal ocular muscles are present, makes binocular fixation impossible owing to the extreme nearness of the far point of distinct vision. Myopia of a high degree is the one error of refraction which may cause diplopia.

Diplopia from paralyzed ocular muscles has as its foundation some acute infectious disease, an exudation or tumour of the brain. Quite frequently with the recovery from the infectious disease the paralyzed ocular muscles are also improved or wholly restored. Syphilis and diphtheria are the two common causes of diplopia. The primary treatment of the infectious disease is the first step to be taken for the relief of diplopia. The second step is gymnastic exercise of the weak muscles by frequent experiments in attempting to overcome weak prisms with the bases toward the muscles to be exercised; the strength of these prisms is gradually lessened till the weakest prism is reached through which single vision can be maintained. The muscles are also further stimulated to action by the use of electricity. In the majority of cases the difficulty disappears under the above treatment, but occasionally the affected muscle remains in a permanently weakened condition. This permanent weakness may be compensated for by a prism with its base toward the weakened muscle. While this method frequently gives great relief to the annoying symptoms, still it must be remembered that a prism is at best a poor crutch to take the place of an active muscle. Prisms give greater satisfaction in vertical diplopia than in any other form of double vision. The tenotomy of the opposing muscle is also a very valuable means for overcoming the difficulty. The opposing muscle should not be cut till sufficient time has elapsed to demonstrate beyond a doubt that the affected muscle is permanently weakened. The importance of this caution being observed is evident. Should the affected muscle recover its former strength, there would be a muscular weakness in the direction of the opposing muscle operated upon.

Muscular Asthenopia.—This is one of the most troublesome chapters connected with the entire subject under consideration. In former years it was a very much neglected subject, but at the present time it is receiving so much attention that it is being overdone in a most ridiculous manner.

When some one of the twelve muscles used in directing the visual lines are weakened to such a degree that the individual can only by a struggle maintain binocular vision, then a most annoying sensation of fatigue is experienced. These annoying sensations have been named muscular asthenopia. The individual complains of weak or painful vision. Errors of refraction are carefully searched for to account for the symptoms complained of. If they are found and their correction relieve the annoying symptoms, then the case is a simple one and muscular defects are probably absent. If errors of refraction are not found or if the correction of those found do not relieve the symptoms, then it is immediately suspected that some one of the ocular muscles is being severely strained in maintaining binocular vision. Here again, as in diplopia, we are obliged to resort to a series of experiments for the purpose of determining which of the ocular muscles is being unduly strained. In diplopia one muscle or set of muscles was not meeting the requirements necessary to maintain binocular vision. In the present case the muscles are all meeting the requirements necessary for maintaining binocular vision, but one is being painfully fatigued in performing the required task.

In diplopia it was an easy task to locate the muscles which were faulty. In muscular asthenopia the task is much more difficult. The technical details of the experiments necessary to locate a weak muscle are simple and easily carried out. The great difficulty arises from the fact that the patient may entirely deceive us during the short time of the experiment by exerting his muscular energy to its greatest capacity. Another patient may have healthy muscles and be entirely ignorant of the necessary muscular exertion required for overcoming double vision. Again, double vision having been artificially produced by prisms, the eyes in many persons have no incentive to fix on a binocular horizontal plane and much less on a binocular vertical line. The eyes of many persons having normal muscles wander about during this experiment in a manner which is adverse to any rule, law, or reason.

I meet patients who, for the reasons above given, have weak muscles and who are able to stand all the tests which indicate the existence of normal muscles. I also meet patients who have normal muscles, as demonstrated as the result of a series of experiments, who are not able at one or more sittings to comply with any of the requirements laid down as a test for demonstrating the existence of normal ocular muscles.

Time has convinced me that there are many more difficulties in the way of demonstrating the existence or non-existence of normal ocular muscles than is acknowledged by those who pose as authorities on this subject.

The old experiment of Graefe for determining the existence of muscular equilibrium has been revived with great force during the past few years, and there appears at present to be a perfect craze on the subject of weak ocular muscles.

The horizontal equilibrium of the ocular muscles is tested by placing a prism of 8° base exactly up or down; the attention is then directed to a lighted candle. If the horizontal muscles are balanced, two candles will be seen, one exactly above the other. When they are not balanced there will be a decided lateral displacement. Covering the right eye with a red glass, one will judge immediately, from the position of the red candle, which muscles are at fault. If the red candle is seen to the left of the white candle, the internal recti muscles are weak. If the red candle is seen to the right, the external recti muscles are weak. The prism base, in or out, which is necessary to bring these two candles exactly over each other, measures in degrees of prism the weakness of the faulty muscle.

The existence of vertical equilibrium is of much more importance for comfortable vision than that of horizontal equilibrium. Vertical equilibrium is tested for in the following manner: A prism of 10° is placed before one eye, base in, and a red glass before the other eye. The attention is then directed to a candle at twenty feet. If the muscles are balanced, the two lights will appear at exactly the same level. When one light stands decidedly higher than the other the vertical balance does not exist and the prism base, up or down, which brings the lights to the same level, represents in degrees of prism the amount of the defect.

Another method of examining for weak muscles, which appears to be more practical, depends upon the comparison of how many degrees of prism each set of muscles can overcome without producing double vision with the degrees of prism the same sets of muscles can overcome in the average individual.

The external muscles of the average person will just overcome 8° of prism without producing double vision. I have, however, seen the ability of the external muscles sink to two degrees of prism without producing any annoying symptoms, while in another case the same degree of weakness produced most annoying symptoms when using the eyes for distant vision.

The internal muscles should, as a rule, with a little training overcome twelve to twenty-four degrees of prism without producing double vision. The vertical muscles should not, under any circumstances, overcome more than three degrees of prism without producing double vision. The ability to overcome more than three degrees of prism with the vertical muscles indicates that they are not properly balanced. In fact the smaller the degree of prism which can be overcome by the vertical muscles the more perfect is the balance between the vertical muscles. With the above facts before my readers, and a few hours spent in experimenting, they will be able to readily grasp the theory and practice of testing for weak ocular muscles.

It will be remembered that to test the strength of a muscle the base is turned away from the muscle to be tested. When a prism is worn to assist a weakened muscle its base is always turned toward the weak muscle.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

20,318. Anthony Reckenzaun, London, for "Improvements in electric clocks, also applicable to electricity meters." Dated December 17, 1889.

20,354. W. H. Lord, Birmingham, for "Improvements in watch chains." Dated December 18, 1889.

20,584. W. Light and J. H. Witcomb, Birmingham, for "Improvements in, or additions to, coin mounts, brooches, and other like articles of Jewellery." Dated December 21, 1889.

20,710. E. C. Fitch, London, for "Improvements in watch-case pendants and bows." (Complete specification.) Dated December 26, 1889.

104. H. R. Stevens, Lowestoft, for "An advertising dock." Dated January 3, 1890.

139. E. Plechawski, London, for "Apparatus for indicating the absolute time and hour-zone time, corresponding to the mean time at any given point of the globe." Dated January 3, 1890.

223. M. Stern, a communication from J. Herzog, United States, for "A new or improved combined bracelet and button-hook or loop." Dated January 6, 1890.

282. M. Settle, Liverpool, for "Improvements in mechanism for preventing damage to the rest of the watch work, in case of the main spring breaking, in going barrel watches and other time pieces or spring propelled mechanism." Dated January 7, 1890.

397. N. Courlander, London, for "Improved joint or connection for securing pins or wires to brooches, or other articles, and the side frames to spectacles." Dated January 9, 1890.

402. F. A. Graf, a communication from D. Heinrich Nahler, Switzerland, for "Improvements in or connected with electric clocks." Dated January 9, 1890.

417. T. T. Harman, Birmingham, for "Improvements in brooches, scarf pins, watch chains, earrings, bracelets, and other articles of jewellery." Dated January 9, 1890.

568. H. J. Crossle, London, for "Improvements in watch protectors." Dated January 11, 1890.

613. A. Troescher, London, for "An improved scarf pin fastener." Dated January 13, 1890.

638. D. M. Scribner, London, for "Improvements in means for attaching together articles of jewellery and the like." Dated January 14, 1890.

808. John Walter Underwood, Patricroft, near Manchester, for "The protection of watches, styled "watch protector." Dated January 16, 1890.

Recent American Patents.

Manufacture of Hollow Handled Articles. Hubert C. Hart ...	417,244
Jeweller's Tray. L. Hirsch	417,640
Cannon Pinion of Watches. G. E. Hunter	417,644
Means of Securing Finger Ring. A. F. Magileth	417,569
Screw Cutting Tool. K. Mischke	417,574
Drill. Geo. H. Tyler	417,610
Paper weight. J. H. Walker	417,375
Buckle. L. Hausmann	417,420
Watchman's Electric Time Detector. H. L. Norton	417,501
Button. K. Dieterich	417,909
Watch. G. E. Hart	418,128
Regulation Indicator of Timepieces. J. T. Clark	417,987
Watch Case. C. F. Morrill	418,047
Watch Bow Fastener. E. C. Fitch	417,999
Watch Movement Plate. G. E. Hart	418,129
Button. C. Radcliffe	417,939, 417,940 and 417,941
Stem Winding Watch. G. E. Hart	418,130
Nut-cracker and Picker. H. Story	417,951
Combined Pen and Penholder. G. H. H. Clement	417,704
Means of Jewelling and end Shaking Arbor Pivots G. E. Hart	417,127
Automatic Electric Clock Winding. F. A. Lane...	417,927 and 417,928
Watch Case, Locket, or similar article. J. J. Croughin ...	418,218
Stem Winding and Setting Watch. A. H. Potter	418,381
Watch. Hy. Jaccard	418,334
Stem Winding Watch. J. J. Croughin	418,401
Chain Link. F. F. Ellis	418,453
Stop Watch. H. A. Lugrin	418,577
Clasp. M. V. Hammack	418,614
Pencil Sharpener. J. T. Morgan	418,376
Coffee Pot. J. S. Stidman	418,390
Fountain Pen. J. D. Bray	418,394
Buckle. C. H. Farmer...	418,556
Inkstand. T. Sweesy	418,584
Screw Driver. D. R. Hart	417,722
Suspender Buckle. S. A. Collins	417,989
Pencil Sharpener. R. D. Richardson	418,066

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

LANCASHIRE AND CHESHIRE.

Jones, Charles and Co., 12, Castle Street, Liverpool, jewellers (partners, Chas. Jones, 3, Orrell Road, Liskard, and Jas. Wm. Clark, 10, Park Road South, Birkenhead, trading as). Trustee, Arthur Addinsell, 16, Bennetts Hill, Birmingham, C.A., with a committee of inspection. Unsecured Liabilities, £5,583 12s. 11d. Estimated Net Assets, £5,121 13s. 8d. Creditors fully secured, £560 5s. Deed of Composition dated January 6, 1890; filed January 13, 1890.

SALOP AND YORKSHIRE.

Galloway, James, late of 130, Briggate, Leeds, now of 65, Mill Bank, Wellington, late a jeweller, now a pawnbroker's assistant. Trustee, Charles Beevers, 92, Albion Street, Leeds, C.A. Unsecured Liabilities, £854 19s. 3d. Estimated Net Assets, £100. Creditors fully secured, £983. Deed of Composition dated December 27, 1889; filed January 3, 1890.

WARWICK AND STAFFORDSHIRE.

Skinner, George, 87, High Street and 62, Varna Road, Birmingham, lately residing at Dalrymple, Wellington Road, Harborne, jeweller. Trustee, Michael J. Goldsmid, 67, Vittoria Street, Birmingham, jeweller, and others. Unsecured Liabilities, £4,721 9s. 9d. Estimated Net Assets, £1,772 5s. 6d. Creditors fully secured, £2 2s. 6d. Deed of Composition dated January 1, 1890; filed January 7, 1890.

BANKRUPTCY.

Re HORACE CHARLES DARBY, of Fox Street, Sparkhill.—A meeting of the creditors of this debtor, now out of business, but formerly a jeweller, was held last month at the offices of the Official Receiver, Mr. Luke J. Sharp, Colmore Row, Birmingham. The statement of affairs disclosed liabilities £105 12s. 3d.; and assets, consisting entirely of book debts, £8 16s. 5d., leaving a deficiency of £96 15s. 10d. In June, 1885, debtor commenced business as a jeweller at 193, Gooch Street, with a capital of £120, and a year later ceased trading as a manufacturing jeweller, and paid his creditors 5s. 6d. in the pound. Some time afterwards he started as a travelling jeweller, with stock supplied by his father, and until the end of 1888 was fairly successful. After that time his business fell off, and he became aware that he was insolvent seven or eight months ago. In February, 1888, he borrowed £30 from Mr. Harry Jones, to whom he gave a bill of sale on furniture and other effects belonging to his wife, and agreed to repay £45. In June last his mother-in-law, who had purchased the furniture, etc., at the time of the assignment in 1886, and presented it to his wife, discharged this liability. For the past three months the bankrupt has not traded. The case is a summary one, and the Official Receiver trustee.

Re E. J. READ, late a jeweller of St. Mary Street, Weymouth.—Mr D'Angibau applied last month on behalf Mr. Hanger that a proof of debt amounting to £34 18s. 8d., which had been rejected by the trustee, might be allowed. Mr. Powning appeared for the trustee. Mr. D'Angibau stated the amount in question was the costs of realising the two leases of No. 83, St. Mary Street, Weymouth. Mr. Powning contended the sale of lease was of no interest and benefit to the estate, besides which he stated the application was practically refused in November last. He further argued that Mr. D'Angibau had not complied with the rules of the Court in serving notice on the trustee and Official Receiver, the latter of whom had had no notice of the application. Mr. D'Angibau argued that Rule 123 alluded to as applying in this case did not refer to it. After some discussion an agreement was arrived at by which the proof was admitted for £15.

CORRESPONDENCE

All Letters for Publication to be addressed to the EDITOR *of* THE WATCHMAKER, JEWELLER, AND SILVERSMITH, *7, St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

TO THE EDITOR OF *The Watchmaker, Jeweller, and Silversmith.*

SIR,—Would you kindly ask, or answer, in your columns, if there is any means of cleaning inside of barometer tubes.

Yours truly,

January 10, 1890. A. LASHMORE.

NOTICE TO MARINERS.—MEDITERRANEAN—EGYPT.—PORT OF ALEXANDRIA—INFORMATION CONCERNING TIME SIGNAL, AND FIRE SIGNALS.

The following information has been received from the Egyptian Government, dated November 28, 1889, concerning the time signal, and establishment of fire signals, at the port of Alexandria :—

1. A gun is fired from the Guard ship *Mahomet Aly* at noon daily, when the ball is dropped the first time at the signal station on Kom El Nadoura (Fort Caffarelli).
2. The fire signals are—One gun fired from the Guard ship signifies a fire in the town; a second gun, fired two minutes after the first, signifies a fire in the harbour, near the coast, or amongst the shipping.

NOTE.—The *Mahomet Aly* is moored in the inner harbour, with the lighthouse on the Inner mole head bearing S.W. ¾ W., distant 2 cables.

(The bearing is Magnetic. Variation 5° Westerly in 1889.*)*

By command of their Lordships,

W. J. L. WHARTON,
Hydrographer.

Hydrographic Office, Admiralty, London,
December 17, 1889.

This Notice affects the following Admiralty Plan :—Port of Alexandria, No. 243; also, Mediterranean Pilot, vol. II., 1885, page 263; Hydrographic Notice, No. 1 of 1889, relating to Mediterranean Pilot, vol. II., page 12; and List of Time Signals, 1888, pages 42, 43.

The substance of this Notice, as soon as it is received on board, is to be inserted in red ink on the charts affected by it; and introduced into the margin, or otherwise in the page of the sailing directions to which it relates. See Admiralty Instructions, 1887, Navigation and Pilotage, p. 308.

Dear Sir,—I have to acknowledge the receipt of a copy of *The Watchmaker, Jeweller, and Silversmith*, containing description of my pendulum, which you have thought worthy of notice. Allow me to assure you that I feel highly complimented by the pains you have taken to give my invention so prominent a notice in your circular, and giving my description in detail, with illustration. I thank you for the effort you have made to bring it to public notice.

There are two typographical errors in the article you used for copy. The first is where I am made to say "fine steel rods," it should read "five steel rods, &c." The next in regard to the piece marked V, it should read "the steel *fin*," not pin.

I have now ten of my pendulums running, and each and every one of them are performing to a degree of accuracy that is truly astonishing to those who were loth to believe that the mercurial pendulum could be excelled, or beaten in performance.

I have mailed you a paper in a separate package, which will give you a better idea than I can in this letter, of the opinions of experts in horological matters.

Enclosed with this letter I send you P.O. Order for five shillings, subscription for *Watchmaker, Jeweller, and Silversmith* for one year, commencing January, 1890.

Very respectfully, yours,
ALVIN LAWRENCE.

No. 64, Central Street, Lowell, Mass.,
December 30, 1889.

Would any of your subscribers kindly inform me what book, with price, would give best hints on the Eye, and how to suit spectacles correctly.

Yours truly,
EAGER.

The Watchmaker, Jeweller & Silversmith.

EDITED BY D. GLASGOW, JUN.

Entered at Stationers' Hall.] [*Registered for Transmission Abroad.*

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

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Address all business communications to the Publishers,
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WITH the exception of a few branches of the cognate trades that have been particularly favoured, the jewellery business generally has just passed through an exceedingly dull month. Not that this undeniable fact at all justifies the croaking we have been having on the subject during the said period, as it is only what past experience should teach us to expect at this time of the year. At the same time, it is a fact that should be recognised in order that the lessons to be derived from it take effect. Of course, the millennium of trade (both manufacturing and otherwise) would be a steady influx of orders; no fluctuations, and prompt settlements—although it is very much to be doubted if, even then, everybody would be perfectly satisfied—grumbling being a prerogative not yet monopolised by the farmer. But, as a matter of fact, these ups and downs of *busy*ness will occur both in long and short periods; that is to say, we shall always have to look forward to more or less depressed periods at intervals of years. (A celebrated political economist once likened the progression of trade to that of a point in the periphery of a revolving wheel, the acme being reached when it arrived at the top, and *vice versa*), while every year, and even month, will produce the minor fluctuations. Last month was one which brought forth the latter with jewellers. There can be no doubt about it. In the present prosperous state of the staple industries of the country, it is impossible that it should be anything else. Jewellers may confidently look forward to a good summer and late spring trade. But, as we have said above, there are lessons to be learned by those who are willing to learn, from even such a temporary lull as that of February. "What are the best methods for counteracting these apparently unaccountable changes in the current and volume of trade?" is a question every jeweller should be asking himself at the present moment. One remedy we might venture to prescribe is, that manufacturers continually bring out fresh goods of new designs and thoroughly advertise them. If this were done as a preventative of dull seasons in dull seasons, there would be no dull seasons.

GENERAL NOTES

Mr. J. L. Sharp, official receiver of the Birmingham district, has been appointed official receiver for Worcester, with Mr. Cox (now in the Worcester office) as deputy.

"Few people imagine when they are swallowing an oyster," remarks Professor Huxley, "that they are swallowing a piece of machinery far more complicated than a watch." But they let it run down just the same.

Mr. W. Margrett, jeweller, Broad Street, Hereford, has on show at his establishment a very handsome silver engraved Tantallus liqueur frame, fitted with three very handsome cut glass bottles. On it is the inscription: "Presented to Mr. Thomas Smith by his brother officers on his retirement from the service of the Great Western Railway Company, Hereford. January 31, 1890."

A large piece of Amber.—The master of the smack "True Love," William Mingay, had a stroke of fortune the other day while trawling off the Texel. On heaving up his gear he found in the net a magnificent block of amber measuring sixteen inches in length, ten inches in width, and nine inches in thickness, weighing nearly two stone. When he came ashore he was offered £16 for the block. This he declined. He proposed sending the amber to London.

Jewellery Robbery at Wigan.—A daring robbery on an extensive scale was committed at the pawnshop of Messrs. Darbyshire and Turner, Hallgate, Wigan, watches and jewellery being stolen to the amount of upwards of £40. The thief gained entrance to the establishment by making a hole in the roof. Among the articles carried away were ten watches, five dozen silver rings, four dozen pairs of gold earrings, three dozen gold keeper rings, and a large variety of other jewellery.

Light Gold Coins.—An Order in Council has been published extending until March 31 the time for tendering light gold coins for exchange under the provisions of the Act of last year. The mode of exchange is also varied, and it is now provided that coins may be tendered during business hours at the Bank of England in London, and shall be there left for such time prior to the exchange or payment as may be reasonably necessary for examination and weighing, in order to ascertain whether any coin has been illegally dealt with.

Alleged Shop-breaking at Leeds.—James Hardaker, a puddler, of Prince Albert Street, New Wortley, was charged at the Town Hall last month with having broken into the shop of Mr. Brownbill, jeweller, Queen's Arcade, Briggate, Leeds. It appeared from the evidence that on the 25th January the shop was broken into, and ten watches, seventeen brooches, and seven rings stolen. Information was given to the police, and prisoner was apprehended when attempting to pawn a ring. Prisoner denied knowing anything about the matter, and said he found two rings in the street on Tuesday, wrapped up in a piece of paper. He was remanded for a week.

Detaining a Watch.—Messrs. George Attenborough & Son, pawnbrokers, Fleet Street, were summoned, before Mr. Alderman Cotton, for detaining a gold watch, the property of Messrs. Backes and Strauss, wholesale jewellers. Holborn. A man named Moulden, who was in the service of the complainants, and who was convicted of larceny, had pawned this watch, which defendants refused to give up. Mr. Attenborough (solicitor) contended that due care had not been exercised, and therefore defendants should be recouped the £4 lent on the watch. The Alderman made an order for the delivery of the watch on payment of £2.

The Paris Tombola.—The chief prize of the great Paris lottery consists almost entirely of diamond mounted jewellery. It is of the value of £8,000, and the following are the various articles:—Diadem comb of brilliants; necklace of roses and brilliants; necklace of brilliants, Ottoman style; pair of earrings, two brilliants, branch of jasmine and wild roses imitated in pearls; three shoulder rings in brilliants; Riviera and crescent of brilliants, mounted in platinum; band bracelet in brilliants; neck pendant in brilliants; gold ring, keeper, with three brilliants. The second prize is also jewellery, and there are many articles the production of the jeweller's art scattered throughout the five thousand lucky winners. It is a pity someone cannot order a similar institution in this country in the interests of the craft.

Action for Salary and Profits.—In the Court of Queen's Bench was heard the case of Ullman *v.* Cohen. The plaintiff, Mr. H. H. Ullman, was the son of a diamond merchant, and the defendant, Mr. A. Cohen, was a diamond merchant at Hatton Garden. The defendant had an agent at Kimberley, who purchased diamonds from him, and transmitted them to this country, and the case for the plaintiff was, that in anticipation of the defendant's agent returning to England, the defendant entered into an agreement with the plaintiff, the effect of which was that the plaintiff should proceed to Kimberley, and ultimately take the place of his agent at a minimum salary of £2,000 a-year, and there was a further arrangement as to profits. The jury found there was no contract as alleged, but on a claim of *quantum meruit*, they awarded the plaintiff £100.

Mr. George Burnett, Lyon King of Arms for Scotland, who died at his residence in Edinburgh on January 23, after a short illness, was a native of Aberdeenshire, and was called to the Bar in 1845. In 1860 he published a work entitled "Pedigree Making." He succeeded the late Earl of Kinnoul in the office of Lyon King of Arms; and he has since been acknowledged to be the highest authority in Scotland on the subject of heraldry. On the death of Dr. John Stuart Mr. Burnett was appointed by the Lord Clerk Register editor of the Exchequer Rolls of Scotland; and he edited with great care and erudition twelve volumes, which throw much light upon many interesting passages of Scottish history. The University of Edinburgh on the occasion of the tercentenary celebration conferred upon him the honorary degree of LL.D. The deceased, who was of a retiring disposition, was much respected, and his loss will be deeply felt.

The Schuler Prosecution Abandoned.—On Mr. Jacob Otto Schuler, wholesale jeweller, surrendering to his bail at the Central Criminal Court, on a charge of causing a gift of his stock-in-trade, to the value of £2,897, to be made to Ernest Schonfeld, with the intention of defrauding his creditors, Mr. Grain, on behalf of the prosecution, stated that Schonfeld, whose firm had been in existence, in Germany, for one hundred years, was undoubtedly a creditor to the extent of nearly £10,000, and since a true bill was found he had sent over to a committee of the whole of the creditors a large sum of money, and had so corroborated the statement of Schuler that the goods were sent to him with the view of an arrangement being made with the creditors. He therefore proposed to give no evidence in support of the charge. Mr. Poland, who appeared for the defendant, having assented, the Recorder said he felt justified in allowing the case to end that way.

The Amsterdam Diamond Cutters.—The great diamond-cutting industry of Amsterdam is passing through a crisis at present, which may have the result of transferring the business almost wholly to London. Of late the dealers and jewellers there have been inclined to sell the precious stones without cutting, leaving that to be done in London, or wherever the buyers might choose. As there are no less than 7,000 hands employed in the diamond-cutting and polishing houses of Amsterdam, the effect of this new departure has been to throw many of the men idle, and to create general dissatisfaction. Public meetings have been held, and it has been resolved to establish a co-operative diamond-cutting and buying business, for which the banking house of Rothschild will be asked to advance the capital, and, this failing, to leave Amsterdam and set up in London. At the present time most of the Cape stones pass through the hands of the Hatton Garden dealers, but should the design of the cutters be carried into execution, and their industry be transported to London, there is no doubt it would give the traffic in precious stones a great impetus.

Thefts from Edinburgh Jewellers.—Two cases of theft of an exceedingly adroit character occurred recently in Edinburgh, and the perpetrators have not yet been secured. As far as particulars to hand show, it would appear that on the day in question a man of respectable exterior entered a shop in Princes Street for change of a pound note, and while the proprietor, who happened to be alone in the shop, was accommodating him, another man entered, and, with the air of a purchaser, began to price some of the goods. The shopkeeper was engaged with both when a cab drove rapidly up to the door, and the occupant, looking out of the window, beckoned the shopkeeper to speak to him. Suspecting nothing, the shopkeeper hastened out to receive the customer's orders, when the two men he had left behind immediately emptied the till containing £40 and decamped. The same proceeding was repeated at another shop, where the thieves were again successful, this time carrying off £10. Their next attempt was made at a jeweller's shop in Leith Street, but the salesman there was not induced to leave the shop, and the thieves were baulked in their intention.

Trade Journals.—The task of educating and instructing the public belongs, without doubt, says the *Jewellers' Circular*, to the trade and class journals. While daily newspapers are gloating over scandals and sensations of all kinds, or distorting facts for selfish ends, the trade journal is reporting the world's real achievements—the progress of invention, the discoveries in the arts and sciences and every laudable individual attainment. The newspaper is concerned chiefly with the world's follies and vices, and does not even pay virtue the homage of satirising them. If a man wishes to be written up in the newspapers he must do something wicked or foolish. Hence there was a void left in the journalistic field. The trade journal sprang up to fill it. When the newspapers find that by running riot in the household, even to the closet, they have earned their own condemnation, they will have to confine themselves to more legitimate sources of news. Meantime the trade or class journal flourishes, strong in its chosen narrow field—the record of commerce, science and art—performing for its constituents a necessary and useful mission.

Ingenious Jewellery Swindlers.—The great jewellers of Paris have just been the dupes of a singular fraud practised upon them with extraordinary success. The swindle has been accomplished in the simplest way, and all it needed for its execution was address, audacity, and a little capital. The combination is not rare, and yet the thieves have at once been set down as Englishmen. French jewellers dress their windows with consummate taste, exhibiting, as a rule, only a small portion of their stock, but of the highest quality and value. The swindlers had amongst them a working goldsmith, whose aid they called in. He studied in the windows the patterns of pieces selected to be stolen. They were chiefly rings and earrings and brooches, where the setting was very plain, and the great value lay in the stones. Duplicates of these were prepared. the setting of real gold, and the stones of the very best imitation, Furnished with these the swindler entered the shop, made a purchase or two, and inspected the costly jewels, but rejected them as too dear. It was not till some time afterwards that the diamond dealer found that he had been left with beautiful paste in first-rate setting. And the same trick had been practised on the same day upon a number of his brethren. If the thieves come again, they'll get paste instead of stones. The jewellers have now had duplicates made of all their best stock, and the window exhibits are all imitations.

Edinburgh Art Students' Association.—Mr. W. S. Black delivered a lecture last month on Design, to the members of this Association, within the National Portrait Gallery. Mr. H. E. Littlejohn presided. Mr. Black pointed out that design required long and arduous study, and that what was generally known as originality was not so essential as was study of the Old Masters in design, whose works had stood the test of ages. The student should learn to draw and paint, but a technical knowledge of the various kinds of manufactures for which the designer worked was absolutely necessary, as without that knowledge his work would most probably be useless to the manufacturer, both technically and pecuniarily. The lecturer strongly recommended that experts in the various manufactures employing the art of design should lecture to the students of the Royal Institution and School of Art. He drew particular attention to the beautiful designs and decoration found in the houses at Pompeii, and he traced the art down to the present day, mentioning the influence that the work of such men as Inigo Jones, the Adams Brothers, &c., had in our own country. Design in stained glass and porcelain also claimed attention, and in the latter case a fine specimen of Wedgwood ware, designed by Flaxman, was exhibited. Dealing with design applied to jewellery, plate, &c., Mr. Black traced this branch of the art through its entire course, exhibiting several beautiful specimens of workmanship in silver, &c. Persian and Dutch tiles were shown, and the lecturer drew attention to their characteristics and beauty. At the close the Chairman proposed a vote of thanks to Mr. Black, which was heartily accorded.

Diamonds.—The correspondent of a contemporary evidently does not believe in the attempt to "corner" this market proving much of a success when things adjust themselves to a more normal condition; he says: There is much talk of diamonds. Most of it is misleading. Some of it, I am sorry to say, is intentionally misleading. The Paris Exhibition caused what is called a "boom" in diamonds. It sent them up to 40s. When so many people were buying diamonds the supply hardly kept pace with the demand. But it was quickened in response to the demand. Diamonds have been poured out, especially in South Africa, in enormous quantities. It was said they were being held by their holders in expectation of a further rise in price. I pray you not to believe it. They are being held because the market is not brisk; because the middleman has his hands full; because dealers do not yet know whether the price is coming down or going up. The only certain fact is that an enormous stock of not saleable crystal is being held in hand by those who hope to become almost monopolists. This stock is growing larger every day. South Africa is still pouring in her yield. Japan, no doubt, is becoming a favourable market, and nobody can say for certain that new fields of enterprise will not open. But the whole thing is doubtful, and those who imagine that their diamonds will double in value in a day or two may be doomed to great disappointment. Diamonds, at all events at the present moment, are not readily saleable. They are accumulating, and the future may have no surprise more remarkable than in regard to all gems which are not absolutely of the very largest size and of the finest water.

Alleged Extensive Electro-plate Robbery in Birmingham.—Samuel White, clerk, Anglesea Street, Aston, was charged with embezzling 9s. 6d. on September 24, 1889, belonging to his employer, Louis Castiglione, electro-plater, Clifford Street, Aston; also with stealing during July, 1888, a case of fruit tongs and other articles of the value of £1 17s. 6d. He was further charged in conjunction with John Barris, clerk, Wheeler Street, Aston, with stealing from Mr. Castiglione's manufactory between July 25, 1889, and January, 1890, two dozen ivory-handle pickle forks, one gong, two cases of fruit spoons, one sifter, and several other articles of the total value of £17 15s. The prisoners were employed by the prosecutor, who carries on business under the style of Henry Parkes and Co., and for a considerable time they had been suspected of stealing from the works. The prosecutor put the police on the alert, and Detective Whitcroft discovered that a quantity of electro-plated goods had been pledged in Birmingham and the neighbourhood by men similar in description to the prisoners. Prisoners were consequently arrested, and on being charged Barris confessed to having had part of the proceeds of the robbery, but accused White of actually committing the thefts. He further implicated White by saying that he made up a box of goods, and addressing them to a firm which had dealings with the prosecutor, sent them to a parcels receiving office in Newtown Row. Before the parcel could be forwarded to its destination Barris called for it, took it to Wolverhampton, and pledged it. White admitted this to be correct. Yesterday both prisoners pleaded that they were guilty. White explained that some time ago Barris was short in his petty cash account, and gave him a number of articles to dispose of in order to get money to put matters straight. He added that he never had any of the money, but Barris said his fellow-prisoner had borrowed money off him, which had resulted in his petty cash account deficiency. The goods were then pledged to get money. Prisoners were committed to the Sessions for trial, Barris being liberated on bail. The charge of embezzlement was withdrawn.

The Diamond Market and Metals.

The Diamond Market.—Little improvement was shown from the buyers' point of view, in the London market during the past month. The usual Cape steamers arrived, bringing medium consignments; but, as has been the case for some time of late, the high prices quoted tended greatly to limit business. Few foreign buyers were present. The Paris trade was simply a repetition of that of the previous month and, as usual, Americans were the principal buyers, either through principals or agents: several largish parcels were shipped for New York accounts. Although the strikes are practically over in Holland, both the Amsterdam and Antwerp workers are said to be still in a very bad way. Sales are few and far between, and the little demand that exists is mainly for small stones and stuff of second-class quality.

Metals.—Markets generally quieter and lower. The latest official quotations are—*Copper.*—Chili bars, G.O.B.'s and G.M.B.'s, cash, £46 17s. 6d. to £47 5s.; three months, £47 7s. 6d. to £47 15s. *Tin.*—Fine foreign, cash, Straits, £90 5s. to £90 15s.; Australian, £90 7s. 6d. to £90 17s. 6d.; three months, Straits, £91 5s. to £91 15s. *Lead* is inactive, Spanish soft, £12 12s. 6d. English ordinary brands, £12 15s. *Spelter* continues quiet. Ordinary brands, £21 5s. to £21 10s.; special, £21 10s. to £21 15s. English soft V & S, £23 Swansea. *Quicksilver.*—The importers' price is £9 15s.; second hands £9 6s. per bottle.

TRADE NOTES

Intended Presentation to Earl Manvers.—The directors of the Manchester, Sheffield, and Lincolnshire Railway Company, having invited Earl Manvers to cut the first sod of their new branch line at Beighton, have commissioned Messrs. Elkington and Co. to prepare a handsome barrow and spade for the occasion. They are made of walnut, richly mounted in silver, each piece being engraved with a sketch of one of the Company's handsome new engines and drawing-room car, surmounting the following inscription:—"Presented to the Right Hon. Earl Manvers on the occasion of his turning the first sod of the Derbyshire and Nottinghamshire lines of the Manchester, Sheffield, and Lincolnshire Railway Company, at Beighton, on Friday, 7th February, 1890." For Lady Manvers, who was also to be present on the occasion, Messrs. Elkington and Co. prepared a very beautiful silver card case, the engine and car in this instance being produced in raised gold on the oxydised surface of the silver. The inscription on the card case is as follows:—"Presented to Lady Manvers on the occasion of the turning of the first sod of the Manchester, Sheffield, and Lincolnshire Railway Company's new Derbyshire and Nottinghamshire lines. 7th February, 1890."

Presentation.—Colonel M. B. de B. Barnett, 1st Kent Artillery Volunteers, was presented with a fine gold keyless hunting lever half-chronometer watch of the best quality, made by Messrs. Donne and Son, 6, Birchin Lane, at a dinner given at the Hotel Metropole. It bears the following inscription:—"Presented as a mark of respect and esteem by the officers of the corps on his retirement after 25½ years' service, January, 1890."

Activity in Trade.—For the time of the year there is exceptional activity in all branches of the jewellery trade; and the *Citizen* says that orders are coming in at least a month earlier than usual, through the anxiety of retailers to replenish their stocks as soon as possible.

The Lancashire Watch Company.—The very appropriate crest (and, we presume, trade-mark) of the new Company is a watch wheel of six arms, in the middle of which is the coat of arms of the county, and around the rim are the words, "Lancashire Watch Company, Limited, Prescot."

Messrs. J. C. Bechtler and Co., of Allahabad, India, have forwarded us a specimen of a medal they have designed and struck as a souvenir of the visit to India of Prince Albert Victor. The design of the memento is well conceived, and the workmanship leaves nothing to be desired, the parts in *relievo* being exceedingly clean and sharp. On the obverse is a capital portrait of the young Prince, and the reverse contains the *raison d'être* of the medal, in an inscription, surmounted by the Prince of Wales' feathers and surrounded by sprays of (presumably) native flora, with a tiger at the base.

Handsome Spade and Barrow.—The first sod of the new Reva Reservoir, which the Yeadon Waterworks Company are about to construct on Hawksworth Moor, was turned on Saturday afternoon last by Mr. J. M. Barwick, chairman of the company. There were present at the ceremony, which was very brief, Messrs. T. Penny, William Coupland, Joseph Peel, Walker Long, Alfred Marshall, and Andrew Harrison, directors; Mr. J. W. Harrison, secretary; Messrs. William Laycock and Levi Haigh, auditors; Mr. T. Arton, chairman of the Horsforth Waterworks Company; and Mr. John Brigg, contractor. A very ornate spade and barrow had been prepared for the occasion by Messrs. Fattorini and Sons, of Bradford. Made of polished mahogany, the barrow, which is of full size, bears on each side four corner-pieces of silver, richly embossed and chased. The centre of each side is covered by a large silver shield, on which are engraved the words, "Presented to J. M. Barwick, Esq., chairman of the Yeadon Waterworks Company, by John Brigg, contractor, of Bingley, on the occasion of the cutting of the first sod of the Reva Reservoir.—February 8th, 1890." The spade is also of full size, and is of the pattern ordinarily used by excavators. The shaft is composed of ebony, elaborately carved; while the blade is of silver, richly chased. The barrow and spade, which were greatly admired, having been presented by Mr. Brigg to Mr. Barwick, the latter gentleman at once proceeded, in a workmanlike manner, to turn the first sod. The gentlemen present were then photographed in a group, and afterwards they dined with Mr. Barwick at Ilkley.

The importance of the optical branch of trade, either as such pure and simple, or as an adjunct to the other fancy trades, becomes more in evidence every day. Messrs. Raphael and Co., of 13, Oxford Street, in this connexion report that for 1889 their sale of spectacles amounted in number to 733,320 pairs, and of folders for the same period, to 366,660, making a total of over a million pairs sold during the year. This number was the result of orders from all parts of the country, and when the details of booking, packing, despatching, etc., come to be considered, the amount of work involved in such a business becomes apparent. Messrs. Raphael and Co. make a speciality of returning all jobs received for repairing on the same day, but we understand that the numbers given above refer to none but new goods sold.

Midland Jottings.

SINCE our last number went to press the application of the Midland House-to-House Electric Supply Company for the sanction of the Corporation to the proposed provisional order for lighting Coventry came before the City Council, and was (as was anticipated by those in the "know") duly refused. It is doubtful if the Company expected any other result in face of the former resolution which was passed by the Corporation to oppose the scheme, and the reasons given for the same, and we don't see how the Council could have very well consistently come to any other decision. Still (unless the Coventry Corporation fulfil their promise shortly and supply the light themselves) their conclusion is regretable in the interests of progress.

One of the grounds given by the Council for refusing to grant their sanction to the application, viz. : that "the promoters of the Company are strangers to and in no way interested in the well-being and prosperity of the city," does not, however, recommend itself (considering the state of modern business relations throughout the country) as a very liberal reason for the refusal. Doubtless the Company would be interested in the prosperity of the city were they permitted to commence operations therein and identify the two interests. The policy embodied in Mr. Punch's well-known anecdote, of heaving half a brick at the stranger, is obsolete.

But, although the paragraph in question might very well have been left out of the Council's representation to the Board of Trade, the other reasons given as objections to the scheme are the only logical outcome of the powers given to the Corporation under the Electric Lighting Acts, which confer upon the city authorities the sole and free control of all such functions as those of lighting the public streets, the right of breaking up roads, &c., and it would be quite an anomaly to have two such powers co-existent in the same municipality.

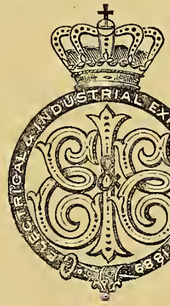
At the same meeting of the Council the voting took place for the election of an Alderman in the place of the late Alderman Scampton, and the Mayor (C. J. Hill, Esq.) was unanimously elected to fill his place.

Mr. Joseph Chamberlain, M.P., has consented to preside at the annual dinner of the Birmingham Jewellers' Association, which is to take place at the Great Western Hotel on the 8th inst., when it may be expected that from the flood of eloquence that is sure to be poured forth on the occasion those interested in the state of the jewellery trade will be enabled to pick out a few facts that will prove to their educational advantage.

Not a few of those engaged in the Birmingham jewellery and kindred trades are just now complaining of slackness, in tones that would denote their belief that another period of depression had already set in. We are quite certain, from the general prosperity of the country and the state of the jewellery trade in particular, that no such belief can be in any way justified. Workpeople are nowhere to be found lacking employment, and it is with the utmost difficulty that manufacturers wanting hands can obtain them. Why then this unreasonable (and unreasoning) conclusion that we are again lapsing into a period of depression? It is indeed difficult to satisfy some people, and in the face of the present prosperous condition of business, a temporary lull, inseparable from this time of the year, gives them the opportunity for croaking, which it would seem they are always on the look out for. We would recommend all such pessimists to compare the business done last month with that of the same month last year and the year before. At any rate our confident anticipation is that a big year's business is before the jewellery trades.

Mr. James Band, of Hearsall Terrace, Chapel Fields, was nominated as a candidate for the Earl Street Ward of the Coventry City Council, to fill the vacancy created by the elevation of the Mayor (Mr. C. J. Hill) to the Aldermanic Bench. His opponent was Mr. John Kemp Starley, the well-known cycle manufacturer. The contest was fought on party lines, Mr. Band being described as a Liberal-Unionist and Mr. Starley as a Liberal. The latter gentleman was elected by a large majority after an interesting struggle.

By the courtesy of Messrs. Swinden and Sons, of Temple Street, Birmingham, who have lent us their block for the purpose, we are enabled to give an illustration of the gold medal (awarded to them and others) of the Birmingham Electrical and Industrial Exhibition, 1889. As shown very clearly in the cut, the scroll letters E. I. E. are pierced out, as is the crown, and the words on the ring are in relief from the gold, the ground being filled in with enamel. The whole makes a very appropriate, unique, and artistic souvenir of the occasion.



The Coventry Watch Trade Association held their annual meeting (an account of which will be found on another page) on the 4th ult. at the Hen and Chickens Hotel, Coventry, for the election of officers and other business. The secretary (Mr. J. S. Wilday) tendered his resignation, on account of pressing business engagements, and although strongly pressed to continue in office, declined to withdraw it. Mr. S. Farren was thereupon elected to the post *pro tem.*

An order was made last month in the Coventry Bankruptcy Court, upon a creditor's petition, for the administration in bankruptcy of the estate of the late James Hoddall, watch manufacturer, of Chapel Fields, who died insolvent. The legal representatives of the personalty of the deceased consented, and the official receiver (Mr. Peirson) was appointed to administer the estate.

On the subject of the hanging of St. Michael's Church bells (Coventry) opinions seem to be pretty evenly divided. Experts having given it as their decided opinion that it would not be safe to ring the bells in the restored tower, the alternatives left are that the bells be placed in their former position and merely chimed or clappered, or that a new tower be built especially for hanging them in and strong enough to allow of their being rung. Mr. Rotherham, in a letter to a local paper advocating the former course, says :—"The only question for immediate settlement is—shall the bells go back into the tower at once and be chimed, or shall they for the next three or four years lie silent where they are?"

Mr. J. R. Vickers, of Chapel Street, Coventry, reports a continued demand for the portrait watches which he has made such a speciality of. One of the latest of these he has constructed is for Steve Brodie, the American champion bridge jumper and swimmer, in which the portrait of "Steve" comes out very clear and distinct. The Yankees have, it seems, developed quite a taste for this class of watch, which they have christened the "Dempsey." As we have already noted, Mr. Vickers has constructed portrait watches for "Sampson" the strong man, and innumerable other sporting celebrities, with whom they appear to be in growing favour.

At a meeting of the directors of the Birmingham Mint, Limited, held on the 14th ult., it was resolved to recommend the payment of a dividend at the rate of 7 per cent. per annum on the ordinary shares of the Company.

Mr. A. Scott, 39, Frederick Street, Birmingham, has just introduced a novelty which should take well with retail opticians and shopkeepers dealing in spectacles. It consists of a sheet of paper on which is a representation of a pair of spectacles, under which is the inscription "Hold to the light and observe that spectacles are equal to a new pair of eyes." On obeying this instruction a well-portrayed pair of eyes is seen looking through the glasses, this being effected by means of a lithograph at the back. Mr. Scott is prepared, we understand, to supply the trade with these sheets in quantities at a very low rate. He wishes to intimate through this medium that he has now special facilities for repairing every kind of jewellery for the trade at the shortest notice.

The proposal to arrange a great Exhibition in Birmingham for the year 1891, on the lines of those held recently at Manchester and Glasgow, has, we understand, been abandoned, owing to the insufficient support accorded the Mayor by the local manufacturers.

While in Messrs. Swinden's office the other day, we were shown the record of a watch they had lately presented to one of their travellers, and which (considering that the watch in question has an ordinary flat spring and single-roller escapement) is truly remarkable. From Jan. 22 to Feb. 22 the mean variation of daily rate was only a small fraction of a second, and this notwithstanding that the watch has undergone the vicissitudes inseparable from the rough wear of travelling. The watch was sprung and adjusted by Mr. J. A. Knott, an employee of the firm.

Whatever fluctuations other branches of the trade may undergo, the fancy for "grandfather" and other quasi-old-fashioned clocks seems likely to be steadily maintained. Visiting the factory of Messrs. W. F. Evans and Sons at Handsworth the other day, we were shown some exceedingly fine specimens of the former style, one clock especially striking us as meriting a short description. This is a long case "grandfather" in a carved oak case, the carving representing incidents of the Elizabethan period. On the door panel are in relief figures of Queen Elizabeth, Sir Walter Raleigh, &c., at the base being a carved group representing the good Queen Bess knighting her favourite. The dial is furnished with gilt old-English pierced numerals which give the clock a very handsome and substantial appearance, while in the centre of the same is an engraving of an Armada naval engagement. The total height of the case is 9ft. 6in. The clock is furnished with Harrington's steel tubes, upon one of which the hours are struck, the quarters being chimed (Westminster chimes) on the remaining four tubes. The movement may be described shortly as a 3-part quarter chime, heavy movement, with dead-beat escapement, maintaining-power and flies. Mr. Evans reports that owing to the heavy and immoral German competition (in which the German makers imitate the English models and cut the prices) the home clock trade, so far as manufacturers are concerned, has practically left this country, and that it is only with the colonial and foreign markets that good business is still to be done. It is a sad admission which candidly nevertheless has to be made, that where it is purely a question of cheapness of labour, we cannot touch the Germans—even in Birmingham—whatever we may originate they will copy, cut down the prices, and spoil the trade.

Talking of immoral competition in business reminds us, however, that our manufacturers here are not altogether spotless in this respect, either with regard to their relations with foreign competitors, or with one another. A case in point came to our knowledge recently which calls forth the above observation. This, in effect, is as follows:—A Birmingham manufacturer dismissed an employee for some reason or other (which is, however, not the point), whereupon a rival manufacturer in the same branch immediately engaged the dismissed employee without knowing anything or enquiring about the reasons for the previous dismissal—it was sufficient for the second manufacturer apparently that the dismissed servant was competent to do the work required and character was a secondary consideration. It is needless to say that such conduct on the part of manufacturers towards one another is the reverse of conducive to subordination among workpeople and calculated to promote anything but a good understanding among manufacturers themselves. We have no hesitation in saying that such conduct thoroughly entitles the offender to the privileges of being boycotted and sent to Coventry by the respectable portion of the community.

BIRMINGHAM
NEWS

From Our Correspondent.

That business among the jewellers here is falling back into its old channels as the spring advances is very evident on all sides. Manufacturers are beginning to think that the revival was after all only a "flash in the pan." Orders are not so urgently wanted as was the case two months since, and the cry for novelties is to the front again, and so those manufacturers who are constantly offering something new to tempt buyers find themselves the best off for orders, and, consequently, do the smallest amount of grumbling.

* * *

I do not find a very great number of new things that have come to light during the last month, but calling upon Messrs. G. E. Walton and Co., Hylton Street, a few days ago they called my attention to some novel ways of casing and carding goods that were proving very attractive to buyers. A patent clip that they have arranged for holding Birch's patent keys upon the card, so that one can be removed at any time without disturbing or loosening its neighbours, is very ingenious and commands a ready sale, in fact, they report more business in these goods than they have ever had. They are the sole makers of Birch's key in England. The firm have printed a good representative catalogue of their goods, which are various, a very attractive line being their art metal clocks, and as they are always prepared to send samples of any goods per return, any buyers who have not yet stocked what are now known as Walton's Novelties will do well to speculate in a parcel.

* * *

The Assay Office authorities evidently think that a little light should be let in upon their ways and doings, as they have just laid down an engine and an installation for the electric light to illuminate their already well-appointed premises in Newhall Street.

* * *

The fourth report of the Committee of the Jewellers and Silversmiths' Association is just put into the hands of the members, and a very complete little pamphlet it is, containing list of officers, report of annual meeting, bankruptcies (with which last year's was very little supplied), annual balance sheet, which shows a nice little balance on the right side. In addition to these items, which are full of detail, a report is given of the School of Art Classes for Jewellers, and a list of prizes, which are given by the Association, and awarded as follows:—Section 1: First prize, £1, second do. 10s., for a set of not less than ten drawings in outline of shells. First prize, Archibald Williams; second do., H. Wright; hon. mention, Arthur Lawley.—Section 2: First prize £1, second do. 10s., for freehand drawing from diagrams selected by the Head Master, the competition to occupy three evenings. First prize, C. C. Hopkins; second do., Arthur Lawley; hon mention, W. Adams.—Section 3: First prize £1, second do. 10s, for sketch time study. First prize, Joseph E. Read; second do., Archibald Williams; hon. mention, A. Rogers.—This year the prizes of £5. 5s., offered by the Goldsmiths' Company, Regent Street, London, will be added to the competition, and I can already hear the expression of considerable satisfaction at the fact of the Goldsmiths Company's offer.

* * *

THE annual exhibition of the works of the students of the Birmingham School of Art and Branch Classes is now open, and upon a visit to the same I found that the Jewellers' Classes, Helen Street, were represented by a select few prize works of the present session. In the competition for flat designs in monochrome an honourable mention is awarded to Frank Couch, Jewellers' Class, Helen Street. In the competition for the best two designs based on floral forms for *repoussé* plates, the first prize has been awarded to Arthur Morgan, Jewellers' Class. His design consists of a conventional arrangement of the Marguerite daisy and foliage; there are evidences of some original thinking in the work, but a little more refinement in detail would have much improved it; however his footsteps are being guided in the right direction and the class is very young at present. I noticed some efforts at designs for silversmiths' work, the subject being a casket to hold the freedom of the City of Birmingham. These were by students at the Central School, and the outlines of some of them were fairly good, but details expressed great lack of practical knowledge and were, in some instances, very undecided as to what they should represent, and when compared with some copies from 16th century work by Hans Holbien that were hanging close by, they at once sank into oblivion. Well, I have no doubt that the classes at Helen Street will do much to improve upon matters, and when they get located in their own premises in Vittoria Street, with technical classes attached, they will be able to show good results.

* * *

I SEE by the circular just issued to members that the second annual dinner of the Association will take place on Saturday, March 8th, 1890, at 7 p.m. exact, at the Great Western Hotel, Snow Hill, Birmingham, and the Committee have much pleasure in announcing that the Right Hon. Joseph Chamberlain, M.P., has kindly consented to dine with them. This is a valuable and friendly acknowledgment of the *raison d'être* of the Association, and is no doubt highly appreciated by the gentlemen composing its ranks. The number of members is much larger now than it was this time last year, and as every member will probably introduce one or more friends on the occasion, the dinner will no doubt be a thorough success.

* * *

IT is interesting to notice how trades cluster together round a small centre for the convenience of working, and the jewellery trade forms no exception to this rule, and if a member of it ventures away into some distant quarter of the town he generally comes back to the little hive and casts his lot among his brethren. So Mr. Bellamy, black ornament manufacturer, who left Spencer Street some eighteen months ago and went to Lodge Road, has returned to Hockley Street, not a stone's throw from his former premises, where he has much larger and more convenient accommodation.

Dishonest Employees.

“LEAD US NOT INTO TEMPTATION.”

THE vast amount of dishonesty existing among the various classes of employees engaged in our trade forms one of the saddest and most difficult problems with which we have to contend. It is a matter which affects alike both masters and servants, and, unfortunately, the constantly recurring instances keep it ever present to our minds. It is a serious reality, and demands our most careful consideration as to the best means for its discovery and prevention. It is universal in its operations, and does not limit itself to any class of worker. From the errand boy to the trusted cashier; from the warehouse girl to the traveller; all grades are infected, and all in turn, give example of its power.

It will be well perhaps, to give a little immediate thought to it; to find out, if possible, the why and the how of its existence, and to formulate some remedy which shall tend to the removal of the evil.

And first, as to its cause—as to the possibility of its existence. We have given long and careful attention to the subject, and we are forced to the conclusion that the real origin of the matter lies, not in the desire and intention of people to be thieves, not in the inherent evil natures of the employed, but where we had least expected to have found it, *in the stupid carelessness of the employers.*

So far as our experience goes, the great majority of those around us have no desire to be otherwise than honest. They are content to go on in the usual routine, earning and spending their money, and doing their duty with the average amount of conscientiousness; but; *but*

> “How oft the sight of means to do ill deeds,
> Makes ill deeds done.”

Even under the best possible systems and with the most careful management, there are great temptations to pilfering in the gold and silver trades. The great value of the materials employed, and the ease with which they can be converted into ready money, seem to irresistibly suggest petty appropriation, while the lax methods which obtain in so many of our workshops and offices, present constant opportunities for such dishonesty.

Take for instance the case of the workman who has a youth under him. At one of their periodical weighings-up they find themselves, purely by accident, some few dwts. short. There is an unavailing search round the board and in the workbox, followed by a reprimand for carelessness, and there the matter ends, and is forgotten. We are quite aware that there are many manufactories where a stricter rule prevails, but we also know that there are many others where this actually represents the case, and it is these “many others” who are responsible for the evils that follow. Continuing, then, our typical example we would ask, Is the matter really forgotten? How about the youth referred to, just arriving at that dissatisfied age when his personal requirements are far in excess of his limited pocket-money? To him how easily comes the suggestion, either from his own “inner consciousness” or from the whispering of some companion:—If an accidental loss is so readily overlooked, why not —— ? and the thought is never finished, but is brooded over in its half-formed state until it becomes familiar and loses much of its repugnance, and at last begins to assume a fascinating appearance. Then some pressing need of money crops up; the crisis is reached; and one more candidate for criminal distinction has entered upon the slippery path. At the next weighing-up, the workman's character for carelessness is confirmed, and the “short weight” lies heavy on the yet tender conscience of his subordinate. But alas! the matter is again passed over only too easily; and the offender, hardened by success, is soon planning fresh depredations.

We do not give this illustration as typical of *every* case of dishonesty among the workpeople. Doubtless, often the evil originates in the bad principled minds of the people, and opportunities for dishonesty are sought for, and made purposely; but we are strongly inclined to believe that in the majority of instances the above closely represents the sequence of events. Further, even where the dishonest desires and intentions exist, there must be the *possibility* of peculation before they can be consummated in actual deeds. Herein lies the great responsibility of the masters. It is unfair to themselves, it is unfair to their dependents, to permit the existence of any such circumstances as tend to invite or in any way to encourage dishonesty. While we are reluctantly forced to admit the impossibility of totally eradicating this evil, we yet think that much might be done to lessen its power, to prevent its growth. The universal adoption of a perfected system of weighing out and in, and a thorough check on the quantity of articles as they pass from stage to stage of their manufacture, would speedily tend to diminish the temptations to, and consequently the actual cases of, dishonesty. An immediate and searching inquiry into all instances of short weight or missing articles, at each stage—no rest being given till the deficiency was satisfactorily cleared up—would at once restore the equilibrium of right and wrong in the minds of the workers; would reduce to a minimum the effect of the persuasive but false eloquence of "it will never be found out." It is imperative on the part of the employers, not merely in self interest, but as a matter of bounden duty to their hands, that such close and decisive supervision should be rigorously enforced.

As to the troublesome question of the receivers of stolen property we scarcely know what to say. It is a commonplace saying that if there were no receivers there would be no thieves, and doubtless there is much truth in it, but to us it seems that the matter lies in a circle—the thieves make the receivers and the receivers make the thieves. We do not see that much can be actually done here, by those engaged in the trade; it is a matter which rests more especially with the police department, and to them we must principally look for deliverance from the plague. Much help, however, might be rendered and valuable hints given by suspected individuals being watched and followed, and their movements reported to the detectives. By concerted action thus between employers and the authorities, there ought to be little difficulty in speedily minimising the operations af these vultures, while their utter extermination should eventually follow.

But our more immediate purpose in this article is to call attention to that more serious class of offences which partakes rather of the nature of fraud and embezzlement than of petty larceny. Unfortunately we have had many—far too many—examples of this sort lately, where men trusted and presumably trustworthy have suddenly gone wrong. It is impossible for us to enter into the feelings of an employer, but speaking for ourselves as holding a position of trust and responsibility, we seem to be enveloped in a cloud of suspicion and distrust. If men, apparently as reliable as ourselves, prove themselves dishonest, and, worse still, upon examination prove to have been systematically dishonest for months and years past, what guarantee is there to *our* employers that *we* ourselves are trustworthy? In the face of the disclosures so continuously being forced before our notice can we wonder if *our* actions are scanned by keen and enquiring glances? Need we be disheartened even if years of faithful service fail to secure that full and implicit trust which it is our highest ambition to deserve and to retain? The influence of these lapses from integrity is extremely widespread, touching more or less all members of the business community; and one of their worst effects is felt in the undermining of confidence between all other employers and employees. A man's evil deeds do not begin and end simply in himself, but they affect to a greater or less extent a very large circle around him: and one case of roguery does more harm than many examples of uprightness can counterbalance. It is hard for a servant to feel himself continually under the detective glance of a jealous master, even when fully acknowledging in general the justice of and necessity for such supervision. It is doubtless hard for a master to be forced, even against his will, to look with distrust upon those who serve his interest. But such are the unfortunate consequences of the failings of others.

While, however, we thus unhesitatingly condemn the evil wrought, there are times when our indignation and our abhorrence are strongly tempered with pity. It is all very well for him who works only in wood or iron to talk glibly of the wickedness of the jeweller who pilfers his scrap and filings. It is easy for the man who never has the chance of fingering a single penny beyond his own weekly wage, to fling his self-satisfied sarcasm after the defaulting cashier. But we who have unchecked access to almost unlimited valuables; we through whose hands passes a constant stream of coin not our own, we know only too well the force of the temptations which certainly *ought to be* resisted; but which in too many instances prove too strong to be overcome.

We are not writing a sermon, nor do we wish to waste time in useless moralising; but we feel confident we are here touching a chord which will find sympathetic echoes in the hearts of many of our fellow-workers. To him whose integrity has stood the test of years our remarks will perchance call forth a feeling of thankfulness for temptations overcome; to him who has fallen and who may be living in daily dread of discovery they may come as an incentive to abandon at once the evil course, and to start anew in the way of honesty; to him who may be passing through the temptations, but as yet with a clear conscience, may they serve as a warning and force him to an instant decision to stick manfully to the good.

Here, again, after careful thought, we are brought to the same conclusion, viz., that much of this class of dishonesty is the result of, and is encouraged by, the carelessness of the employers. Is it not a fact that, speaking of the jewellery trade generally, an overwhelming importance is attached to the selling of the goods, while the need for and usefulness of correct book-keeping is placed at a minimum.

How often does it happen that the whole office routine,—posting the sales, rendering and collecting the accounts, and balancing cash book and ledger—is all under the control of one individual, without check or supervision? Or, where the books are looked over, the check is so superficial and so easily evaded as really to increase the danger while apparently tending to security. And as regards the wages sheet, is it not usual for this to go for months at a time without being looked over by a second person, while such a thing as comparing the cash actually paid to the workpeople with the amounts debited to them is never dreamt of.

This unlimited confidence, or rather, to transplant a phrase from the region of ethics, this "deep slumber of a settled conviction" is not healthy and it is not good. Doubtless, in moderation it is a virtue, but carried to extremes, as here instanced, it becomes a vice. It puts too great a strain on the good principles of an employee, and while apparently encouraging the growth of a manly and self-dependent honesty, in reality it gives a passive encouragement to a mean and sneaking roguery. It is a splendid thing to "trust to one's honour" when that honour is checked and safe guarded by fair regulations; but it is entirely a mistake to blindly trust to the honour of an immature and unformed character, especially when the said trust implies constant subjection to alluring temptations. Are there not many who under proper and business-like conditions might have remained upright and honourable servants for a lifetime, but who, lacking experience to grasp the value of personal integrity for its own sake, and without sufficient force of character to strive to retain this integrity, have glided heedlessly into habits of dishonesty. As in our former instance so here in many and many a case is mere carelessness to blame for the first promptings to evil. A casual error too readily overlooked; an accidental omission from the cash book passed over without question; these, blameless as they appear at first sight, have yet much to answer for in the matter of "dishonest employees."

Again, the remedy lies principally with the masters. In the case of small businesses let there be a careful checking of all the books on the part of the principal; with larger concerns we would advocate an independent audit by professional accountants. It were both time and money well spent. Prevention is better than cure. By removing the possibility of dishonesty,

honesty is pretty well insured. The knowledge that any transgression will be immediately detected is the best possible tonic for weak principles. It strengthens the character; it determines the powers of resistance; it prevents those morbid suggestions and unhealthy broodings which are so prolific of bad results. Nor let this forced honesty, this constrained growth of character, be valued too lightly. The best intentioned amongst us has no idea of his powers of resistance until confronted with actual opportunities. Human nature at its best is frail. Good intentions are only too easily overcome. It is better that we should be honest simply because there is no chance for us to be otherwise, than that we should be dishonest. "Honesty" merely as a "best policy" is decidedly preferable to its opposite.

And for us who would have to work under these repressive conditions, surely we have no need to complain of them, or of their legitimate operation. They are equally for the good of, and beneficial to, ourselves as the masters. The prayer *we* most need to pray is—"*Lead us not into temptation*," and all fair and legitimate efforts at self-preservation on the part of our employers, are direct answers to this petition. Irksome they may be at times, but certainly they are to our mutual advantage.

Another means of checking the tendency to dishonesty is for the masters to keep a careful eye on the habits and conduct of their people. Lax morals and loose modes of living are matters easily detected by the keen observer, and, especially when accompanied by any undue expenditure of money, should receive immediate and searching enquiry. By this means many a crime would be prevented, many a criminal career would be stopped short, and turned back to the way of virtue.

To horse-racing and all matters related thereto we would call particular attention. It behoves the masters to take instant and decisive action whenever they find anyone dabbling in such matters. Let there be no compromise—either the thing to be totally abandoned, or instant dismissal. How much of the crimes around us, how many blighted careers, are due to this pernicious habit it is impossible to say; but we unhesitatingly give it as our opinion that no one who has anything whatever to do with it is safe to hold a position of trust. The risks are so great, the temptations are so severe, that it is almost impossible but that, sooner or later, the man shall fall. Take heed, therefore, you to whom this paper is addressed (both employers and employed), and give this matter your most careful consideration.

There is one more subject to which we wish to refer, but gently and with consideration, as we are conscious we are treading upon delicate ground. We mean the amount of wages paid. That man is seriously handicapped who, holding a responsible situation, is expected to keep honest on a low salary. It is imperative that a fair remuneration be given, according to the quality of work required and the ability dispayed in its execution. Honesty must be recognised as a marketable commodity, to be paid for according to its value. To give a man a position involving constant opportunities and temptations to dishonesty, and to yet pay him insufficiently to enable him to meet the ordinary expenses of his sphere of life is simply to put a premium on roguery. But, alas, even as we write there crowd into our mind numerous instances where men drawing large and even liberal salaries have proved faulty. After all, integrity and uprightness are independent of material recompense: a high salary will not ensure honesty, a low one does not necessarily infer the reverse. Nevertheless, we would still argue that an employer gives a fairer chance, both to himself and his dependents, by paying a rate of wages above rather than below the limits of a bare existence.

The foregoing remarks, while referring specially to cases involving the actual handling of cash, apply, we think, with equal force to those instances where goods, finished or otherwise, are the source of temptation. The routine is the same, the means for their prevention and detection are identical, while as a rule they are more easily dealt with because of the more or less difficulty experienced in converting such articles into money.

As to the best methods of dealing with instances of dishonesty when discovered, the various circumstances of each case must principally determine the procedure. Where the matter bears unmistakable evidence of being a first offence, immature and thoughtless, we think the shame and disgrace of exposure, followed by a carefully expressed admonition, may be a sufficient punishment, and under ordinary circumstances we would even advocate for the culprit an opportunity to regain his former position. Such a lesson may often be the making of a character, and from the ashes of a foolish indulgence a steadfast growth of integrity may arise. But where the case shows deliberate thought and intentional planning; where the offender exhibits a hardened and "don't care" demeanour in every repeated instance we would, for the sake of the culprit himself, for the sake of his fellow-workers, for the sake of the trade at large, hand him over to the police authorities, and subject him to a public prosecution. A few such examples would undoubtedly do much good. The policy of inconsiderate mercy, letting a culprit off rather than trouble to punish him, is a great mistake. The idea that speedy detection and just punishment are inevitable would have a great deterrent effect on crime of this nature, while every instance of condoning and hushing up is a direct encouragement to repeat the offence.

A short personal reminiscence will illustrate this subject, and fittingly conclude the present article. We have a vivid recollection of having once, in the far-off days of boyhood, pilfered a sixpence from the paternal mantelshelf, where unfortunately (or perhaps in this case fortunately) sixpences were not so numerous but that one would be missed. This one *was* missed. The thief was discovered, and due and severe punishment was administered. Without necessarily applying to ourself the logical moral of our primitive lesson books anent the boy who commenced by stealing a pin and ended his career by being hung for murder, we are yet conscious that the severe lesson we then received has been for our lasting good. We have not the slightest desire to speculate as to what might have happened had that attempt of our early school days been successfully (?) carried out, but of this we are certain, that its immediate detection and prompt punishment was, under the circumstances, the very best thing that could possibly have happened to us.

Employee.

The Automatic Gas Apparatus of the Coventry Market Hall Clock.

We have received the following communication from Mr. E. T. Loseby, with reference to a paragraph which appeared in our Midland Jottings for January. The admirable performance of the clock itself, which we have before had occasion to notice, is again testified to in the extract from the *Coventry Standard*, as well as in the subjoined copy of a letter from the town clerk, Mr. Browett. In standing sponsor for the paragraph in question, to which Mr. Loseby objects, it is only necessary to say that we were misled (in common with others) by statements made at the Coventry City Council, and we are only too pleased to be able, on the best authority, to put the true facts of the case before our readers.

Sir,—There appeared a paragraph at page 156 of your January number stating that the Automatic Gas Apparatus of the Coventry Market Hall Clock had repeatedly failed. This was so erroneous that I hoped the person who had sent the information to you would have corrected it in time for publication in your February number; this, however, has not been done, and I therefore submit the facts:—The dials of the clock were in darkness two evenings at the beginning of last December, on account of water having accumulated in the pipe and meter and stopped the supply of gas 80ft. below the clock dials, where the automatic apparatus is situated. The automatic apparatus acted perfectly during the time, but the gas having been extinguished, by the supply being stopped 80ft. below, its action was of no avail, as the apparatus does not light the gas, but merely turns it up and down in the following order:—At dusk the apparatus turns the gas fully up and it remains so until 12 p.m., when it turns the gas down low until 5 in the morning in winter; it then turns the gas up again until daylight, when it turns the gas down to the lowest jets that will remain safely alight during the daylight. All these movements the apparatus does automatically. It moves on a small quantity each day throughout the year, and accurately follows the lengthening and shortening of the days, without requiring any alteration by hand from one year's end to the next. This it has done with great regularity throughout the nineteen years it has been in action in the tower. I have looked through the records of the clock for the last seven years, and find the apparatus has not been out of order once during that time. E. T. LOSEBY.

New Walk, Leicester,
February 17, 1890.

P.S.—I enclose for your own information a paragraph published in two of the Coventry newspapers (*Herald* and *Standard*) on December 13, from which you will see the cause of the dials being in darkness was widely known in Coventry a fortnight before the erroneous paragraph appeared in your magazine for January. I also send copy of a letter received from the Town Clerk of Coventry.

Dear Sir,—I have received your letter of the 13th inst. and enclosures, which shall be read to the Market Hall Committee at their next meeting. The Automatic Gas Apparatus has, with one exception, always acted correctly, and this exception was due not to the apparatus, but to some water accumulating.

The Market Hall Clock is a marvel for accuracy: we know of no such timekeeper anywhere, and are very proud of it and grateful to you I am sorry that misstatements, all utterly groundless, should have found their way into the papers to annoy you. Yours faithfully,

Coventry, (Signed) THOMAS BROWETT.
January 16, 1890.

E. T. Loseby, Esq.

The following appeared in the *Coventry Standard*, dated December 13, 1889:—

The Market Hall Clock.—Comparisons of the Coventry Market Hall town clock with 1 o'clock Greenwich time signal, for week ending December 7, made by J. J. Farmer, at the foot of the tower in street.

1889.		Clock on Signal. s.	Daily Variation. s.
December	2	Fast 0·4	0·2
,,	3	,, 0·3	0·1
,,	4	,, 0·0	0·3
,,	5	,, 0·0	0·0
,,	6	,, 0·0	0·0
,,	7	,, 0·0	0·0

No alteration of the time or regulation of the clock has been made since November 5.—E. T. Loseby.

Note.—Concerning the gas being extinguished at the beginning of last week, I find, after personal enquiry in Coventry, that the gas went out on Sunday evening and was not relighted until Tuesday evening; that the cause of the gas going out was the accumulation of water in the pipe and meter in the cellar of the tower; that the water was let out of these by a man from the gas office, and the gas relighted at 8.55 on Tuesday evening; that the automatic gas apparatus connected with the clock acted perfectly, and had nothing whatever to do with the gas being extinguished, and the suggestion made at the Council meeting is therefore erroneous, the sole cause being water in the pipe and meter, situated 80ft. below the said apparatus; that the reason the defect remained two days without being removed was because those who knew about it abstained from communicating the fact to anyone likely to alter it, some of them apparently preferring to bring it forward as a complaint before the City Council, thus retarding the removal of a defect two days which might have been removed in two hours, had it been reported to J. J. Farmer, 6, Dover Street, Holyhead Road, or to the manager of the gas office, Hay Lane, or to E. T. Loseby, Leicester.

Coventry Watch Trade Association.

ANNUAL MEETING.

THE annual meeting of the Coventry Watch Trade Association was held last month at the Hen and Chickens Hotel. The Chairman of the Committee (Mr. I. J. T. Newsome) presided, and there were also present Messrs. S. Farren, J. West, J. A. Jelts, T. Price, R. Loverock, T. D. Smith, J. Fairhurst (collector), J. S. Wilday (secretary), J. Hallam, — Rice, W. Matthews, A. Flavell, A. Gurney, &c.

The Chairman, in opening, regretted the attendance was not larger. He thought the reason of this was that many members, thinking the Association had accomplished a great deal, having brought the trade into a better condition than last year, there was no necessity to further look after their interests. But that was where they made a very great mistake. It was evident that, if they did not look after the interests of the trade, they would be in a worse position than they were before the Association was formed. They had heard of several infringements of the Merchandise Marks Act, which they had worked so hard to pass, of several instances of people creeping in and evading the Act here and there. They had heard of many things that affected the watch trade, and it behoved them to take as much interest in the work of the Association as before. It was a great error to suppose that, because they had accomplished something, they could afford to neglect their own interests. There was, however, a sufficient number present to transact business, and he believed all of them took a great interest in the trade. The Chairman, proceeding, said he had received a letter of apology for non-attendance from Mr. C. Read, who wrote that he trusted they would have a good and united meeting. Mr. R. Waddington and Mr. S. Yeomans also intimated their regret at being unable to be present.

The Secretary then read the report as follows:—

"The Committee of the Coventry Watch Trade Association, in presenting their second annual report, beg to congratulate the members of the trade generally upon the continued prosperity of the trade during the past year, and a prospect of a continuance of the same in the future.

"At the beginning of the year, on account of information received by the Committee, they requested the London Association to purchase from a large firm a certain class of watch, a detailed description of which was given, with a view to a prosecution. Having succeeded in getting one of the watches, which, upon examination, turned out to be largely composed of foreign material, proceedings were taken and terminated successfully for the Association, and the defendants were mulcted in a fine of £20 and £5 costs. Several other cases have been reported during the year, but owing to insufficient evidence and the fact of the watches not being exposed for sale in Coventry, but chiefly sent abroad, or to such towns as London, Manchester, Glasgow, and Edinburgh, the Committee have experienced great difficulty in following them up without going to a much greater expense than the funds of the Association appeared to warrant them in doing: but they hope to be able to overcome the difficulty before another year is passed by the appointment of an executive council composed of the chosen delegates of the Association of London, Coventry, Prescot, and Liverpool, and any other associations that may be formed in the future, who would be able to make arrangements for more extended action than can be done by each Association acting separately. Delegates have been appointed to attend a proposed conference to be held in London on an early date date to consider the foregoing suggestion and other important matters in connection therewith.

"The subscriptions for the past year have not been collected so satisfactorily as could have been wished, owing to unavoidable circumstances, and consequently show a falling off as compared with last year, the total amount collected being £19 2s. 6d., as against £28 13s. 6d. last year. The expenses for the year have been £18 12s. 3½d., leaving a balance in the bank to the credit of the Association of £20 7s. 5d."

The report was adopted.

The election of officers was then proceeded with as follows:—Committee: Messrs. I. J. T. Newsome, A. Walker, and C. Read (manufacturers), Mr. R. J. Pike declined re-election, and Messrs. Pyott, Jelts, and Hannah (workmen). Trustees: Messrs. S. Yeomans and J. West. Auditors: Messrs. T. D. Smith and S. Farren.

The Chairman regretted that the Secretary (Mr. J. S. Wilday) could not see his way to continue in office on account of business engagements. He could not, however, allow this opportunity to pass without paying Mr. Wilday what kind of compliment he could for the very efficient manner in which he had performed his duties since the commencement of the Association. He could safely say that they would not have brought the Society to such a successful issue—with such a handsome balance in hand—if it had not been for the indefatigable work of Mr. Wilday. He was sure the Secretary's retirement would be received with very great and general regret.

Several present having added their regret at losing the services of the Secretary,

Mr. Rice said he understood the resignation was brought about by trade matters, and could perhaps be cleared up.

The Secretary said one of the reasons of his retirement was that scandalous reports had been spread abroad, alleging that he paid unfair prices for work. He did not know from whom originated the reports, but he had his own opinion. The author had gone so far as to interfere between him and one of his customers. A further reason for his decision was pressure of business engagements. He thought it was his duty, when such reports were made against him, to resign. He was consoled, however, with the knowledge that he had conducted the business of the Association to the best of his ability, and with acknowledged success.

After some discussion, in which Mr. Wilday declined to withdraw his resignation, though repeatedly pressed, the resignation was accepted, and Mr. S. Farren appointed *pro tem.* Mr. Wilday was appointed auditor in the place of Mr. Farren.

Mr. Newsome, in acknowledging a vote of thanks for his services as Chairman of the Committee, expressed his willingness to do anything he could for the benefit of the Association. He thought if the Association was in the future carried on as well as in the past, the trade generally would be much benefitted. He did not think there was a man in the trade but who could say that the Association, in the short time it had been established, had been the means of bringing about very great beneficial results to the watch trade of Coventry. The meeting then terminated.

Gold in Wales.—Speaking at Dolgelly the other day, Mr. Pritchard Morgan, M.P., said he was glad to say that the gold mines of North Wales had from the opening been one continued success. Since the formation of the company, in June of last year, they had crushed 7,325 tons of quartz, yielding 7,893 oz. 9 dwt. of gold, or an average yield of 1 oz. 1 dwt. 13 grains of gold per ton. This had resulted in a profit to the shareholders of £10,500, being at the rate of 5 per cent. during the first year. This profit had been fully maintained during the half-year ending the 31st of December, as a dividend of 5 per cent. would be declared. They were now working forty head of stamps, with a crushing power of 100 tons, and about 200 men were employed at the mines. The directors had decided to enlarge the mines. They had now secured the whole of the gold-bearing reefs lying between the two mountain streams of Gwynfydd, by which the present lease of 28½ years of 137 acres of land would be extended for 35 years of nearly 900 acres. He felt perfectly satisfied of the permanency of the industry. If the quartz in the future averaged one half of what it had done in the past, there would be a profit of £30,000 per annum. They would thus see that, with the increased capital, new machinery, and more men, they had every reason to believe there was a bright future for gold-mining in Wales.

Origin of Gem Engraving.

IT is difficult to trace the origin of gem engraving; doubtless the mode of cutting and preparing hard stones was devised by the necessities of the early nations, and employed by them in the formation of tools and military weapons, the knowledge of the superior utility of metals for those purposes being comparatively, if not quite, unknown. The antiquity of this invention is established beyond all question. Croly, in his remarks on this subject in the gems so charmingly etched by Dagley, remarks:—"India, the common source of all the arts, probably gave birth to it. Signets of lapis lazuli and emerald have been found with Sanscrit inscriptions, presumed to be of antiquity beyond all record.

"The natural transmission of the arts was from India to Egypt; the whole symbolic mythology of the latter people occurs upon hard stones of almost every description. The stones of the Jewish High Priest's breastplate were engraved with the names of the twelve tribes, and of these stones one was a diamond.

"The Etruscans, a singular nation, whose existence is scarcely known but in the fragments of their arts, but who, on the faith of these fragments, must take a high rank among the polished nations of the old world, have enriched our collections with gems of a compound style. Their general shape is like the Egyptian—that of the Scarabœus—and where the shape differs the Scarabœus was frequently found engraved. The subjects are chiefly Greek, but of the more ancient story of Greece—the war of the Chieftains at Thebes, Peleus devoting his hair, Tydeus after bathing, Hercules bearing the tripod, &c."

There appears to be no proof that mechanical skill attained any considerable perfection in the infancy of the art. The Indian characters are sufficiently rude, and most of the Egyptian hieroglyphics are as coarsely indented as possible; indeed, if we give the case a moment's reflection, it could not be otherwise—the operation must have been chiefly effected with much labour and loss of time by the hand. Whatever conjectures might be hazarded upon the subject, it is quite clear that the Greeks have no claim to the machinery by which the process of gem engraving is effected. The merit of it appears to rest with the Egyptians, but as the art travelled from the banks of the Nile to the shores of Attica, it became invested with a character of dignity and importance proportioned to its merits; and patronised by the great names of antiquity, it kept pace with the higher studies of sculpture and painting. Thus, with the lapse of ages and the progress of civilisation, the feeling of enthusiasm for this beautiful study and the knowledge of its mechanical execution increased, and in the time of Pericles, when Greece was at her loftiest eminence of splendour, the art of gem sculpture attained its justly boasted perfection.

The beauties of Grecian art expired not with her liberties. When the phalanxes of those whose ancestors conquered at Marathon and Platæa were scattered before the cohorts of Rome; when the spirit of freedom departed, the genius of the arts lingered behind and shed a ray, dim and imperfect, but still lovely, over her vanishing glories. The arts, in general, flourished with the rising majesty of Rome, nor were our beloved gems forgotten. On the contrary, their triumphant march continued; and prior to the reign of Augustus, as well as during that period, some of the Roman artists rivalled the excellence of their Greek predecessors. The works which yet remain to us incontestibly prove how much this art was appreciated, how much it was encouraged, and the consequent elevated station which was gained by those employed in its cultivation. Indeed, the very large size of the apotheosis of Augustus and the Vienna gem (cameos of singular beauty) would almost induce a belief that the apparatus employed in those days differed somewhat from that with which we are now acquainted.

Here a blank occurs in our history. The mother of nations was at length hurled from her pinnacle of universal empire, and it is bootless to seek for aught allied with in mind during the despotism of man, who boasted "that no green thing ever flourished on the soil where their horses' hoofs had once trod." In the fifteenth century gem engraving revived. Italy was the chosen place for the recommencement of her career, and there are some interesting and curious specimens of her progress during that period still remaining.

We hasten now to more modern times. The names of Pekler and Notter, among the Germans, are familiar to every amateur of gems. Their productions (particularly those of the latter) approach very nearly to the beauty of the antique. Mr. Croly, in his work, has mentioned with praiseworthy complacency the very high rank which some of our own countrymen have attained in this department of art—the names of Brown and Marchant are sufficient to attest this fact—but why is that of Burch omitted, who was unquestionably the father of gem engraving in this country? To the list might safely be added the names of Wray, Dean, and Frewin, as not likely to be forgotten by those who are capable of appreciating excellence in works of this description.

Mr. Tassie, in his invaluable repository, has impressions from almost all the various collections of gems in the world, by means of which those works, which otherwise would have been buried in comparative oblivion, are attainable at a very trifling expense by every lover of the fine arts. *This is the most complete collection in Europe*, amounting to nearly twenty thousand in number and comprising casts of almost every gem, whether antique or modern, of known celebrity. It is not so fully known as it should be that in Tassie's collection there are also above twelve hundred fine impressions from the splendid Greek and Roman coins, collected at an immense expense by Dr. Hunter. The importance of these also deserves to make them a favourite study with the accomplished mind of England. These relics of antiquity, as well as the gems, may be truly said "to revive the forgotten skill and the varnished beauty of bygone ages."

Legal.

Levey *v.* Attenborough and Another.

IN the High Court of Justice, Queen's Bench Division, last month, before the Lord Chief Justice and a special jury, the plaintiff, Mrs. Catherine Levey, of Palace Court Mansions, Bayswater, sued Messrs. George Attenborough and Son, pawnbrokers, and Mr. Gall, a jeweller, alleging that they had wrongfully detained and converted a diamond necklet, which was her property. The defendants denied that they had wrongfully detained or converted the necklet in question.

Mr. R. T. Reid, Q.C., Mr. J. Lawson Walton, Q.C., and Mr. Lowenthal, represented the plaintiff; Mr. Jelf, Q.C., and Mr. J. F. Clerk, appeared for Messrs. Attenborough; while Mr. Mattinson was counsel for Mr. Gall.

It appears from the evidence that in July, 1888, the plaintiff, a widow lady, possessed of considerable property in Australia, saw a money-lending advertisement under the name of Leslie, and wishing to borrow £2,500 for a short period pending the arrival of her income, she communicated with the advertiser, whose proper name was eventually found to be Hollis. Hollis professed to be ready to make the advance, but demanded £10 for preliminary expenses, which the plaintiff paid. Hollis then asked for £100 in advance on account of interest, which was to be at the rate of 5 per cent. for three months, and plaintiff, as security for this amount, handed to him the diamond bracelet now claimed, which she had purchased at Messrs. Howell and James's for £210. Subsequently plaintiff changed her mind about the advance, and demanded her necklet back, but was unable to obtain it, and shortly afterwards Hollis was prosecuted in regard to an offence in relation to some other property, and sentenced to a term of imprisonment. It then transpired that he had pledged the necklet with Messrs. Attenborough for an advance of £70, and they, it appears, sold it to Mr. Gall after the expiration of the period for which it was pawned. Plaintiff claimed to recover the necklet, on the ground that the circumstances under which it was obtained by Hollis amounted to a theft.

In support of her case, the plaintiff and some other witnesses were called, including a manager at Howell and James's, who stated that they purchased the bracelet in the morning for £160, and sold it in the afternoon for £210.

At the conclusion of the plaintiff's case, Mr. Jelf submitted that there was no case, and in the course of some discussion his Lordship suggested a settlement.

Ultimately it was agreed that the frame of the necklet from which the gems had been removed and used by Mr. Gall in the ordinary course of trade, should be filled up with diamonds at certain prices per carat for the different classes of stones, the plaintiff to be at liberty to pay an additional sum to secure better diamonds if she pleased.

Mr. Jelf trusted that his Lordship thought that Messrs. Attenborough's had acted fairly in the matter.

The Lord Chief Justice: I think they have done what I should have expected them to do; but perhaps they will allow me to add that I am happy to say that I don't know anything of them, except in court.

Mr. Mattinson said Mr. Gall purchased the necklet at a public competion, and paid something over £84 for it. He had agreed to the settlement, and made himself liable for half the loss.

Judgment accordingly.

Riefler's New Escapement.

Escapement for Chronometers and other Watches with Balances completely free, and for Pendules with Pendulums quite free.

MR. S. RIEFLER, engineer and manufacturer of Munich, gives, in the *Journal Suisse d'Horlogerie*, a description of his latest escapement, of which the following is a translation:—

One of the most important instruments for the determination of the geographical situation of vessels at sea is the chronometer.

In 1714, Newton, as a member of the commission appointed by the English Parliament to verify the longitude, and to find a sure and easy method of determination, declared that the best means was an exact measure of time.

But, notwithstanding the great prize offered by the English Parliament, no useful results were obtained from the watches with the balances of that day.

The reason will be seen presently; it was that the balance of the systems of that time (verge and cylinder escapements) could not oscillate freely, because it was largely influenced by the faults of the gearing and by variations of the friction.

Thus the efforts of the scientific men and horologers of that epoch were directed towards finding a construction that would allow of the balance moving with the greatest liberty. It was at this period that Pierre Le Roy invented at Paris, about the middle of the last century, the first free escapement which answered to any degree the general high expectation, and which is still applied to-day to chronometers for the determination of longitudes. The French Academy of Sciences immediately recognised the great importance of this invention, and inscribed the following in their "Memoirs" of the year 1748:—

"New balance escapement, invented by Le Roy *fils* (Pierre Le Roy).—Instead of as in the balance escapements known up to now, the wheel resting at each oscillation of the balance upon a piece which is solid with it and upon which one of the teeth rubs, the wheel of this new escapement rests at each demi-oscillation upon a piece (unlocking spring) fixed upon the plate, and completely separated from the balance. This idea is new and capable of procuring numerous advantages."

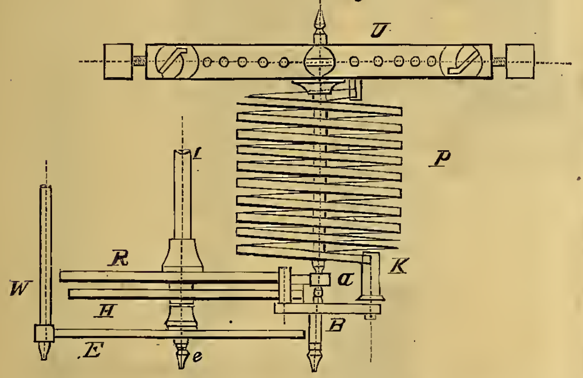
Nevertheless, the escapement of Pierre Le Roy only merits in a small degree the name 'free escapement.' The balance does not perform its oscillations in complete liberty, because it is of one part in communication with the train from which it receives impulse, and it has on the other to effect the unlocking of the train, an operation in which it must surmount obstacles that are not of small importance.

The author of the present writing has thought it interesting to ascertain if a balance performing its oscillations with still more independence than that of Le Roy would not give results still more advantageous than the latter.

It is this from which one can hardly doubt theoretically that which seems like going back again to observations made with the greatest care, and which Le Roy himself has already presented (*see* Cl. Saunier, *Traité d'Horlogerie Moderne*, No. 675). In conserving the principle of the transmission of force of the train upon the balance, a principle that consists in that the escape wheel communicates an impulsion to a little lever upon the axis of rotation (fusee, cylinder, lever, duplex, and chronometer escapement, etc.) one would hardly dream of resolving this problem.

It is necessary then to recur to another principle, consisting in this, that *the transmission of force from the train upon the balance is effected by the interposition of the balance spring.*

Fig 1a



If the balance moves from the state of repose, the spring has a certain tension which increases with the amplitude of the oscillations. If this tension is augmented at a moment suitable to the train, it acts as a transmission of force. This is rendered possible by the fact that one of the ends of the spring is not fixed as formerly, but is movable.

The function of the train is then here to give, at the proper moment, a to and fro movement to the attached point of the spring (pin) at each oscillation of the balance.

The first escapement to which this principle was applied was constructed by me in 1869, and the model was executed during the Easter vacation of the same year. (I studied then at the Polytechnic school of Munich). But this first construction, like a great many others that I made in the course of years following, had no practical importance. The principal reason was, for one part, that it did not act with sufficient smoothness, and, for the other, that it was too complicated. More than in all other machines, the certain action of a watch depends enormously on its simplicity of construction.

In was only at the commencement of the year 1889 that I succeeded in the construction of the escapement described further on, an escapement perfect in theory, and remarkable at the same time for a simplicity so to speak surprising. Besides this, this escapement is applicable also to clocks having pendulums totally free.

I.—Description of the Escapement Applied to Watches.

Below the pivot *a* of the balance and upon its prolongment is the pivot of a lever in the form of a star B with three arms or radii. To one of the arms, at the point K, is fixed by the stud one of the ends of the balance spring P; the two other arms carry above their plane surface the stones of lift and repose S and S', which are cylindrical half their length and cut away at their superior extremity up to the middle of the cylinder pivot (a lateral view is given at the side of Fig. 1 *b* at the point *b*). At the surface of the cylindrical part the lift is produced, and at the plane surface, the dead point, or of repose.

Upon the axis *e f* is an impulse wheel H, and above this a wheel of repose R with a little space between them. The teeth *h* of the first wheel determine the lift or the oscillation, and the teeth *r* of the second effect the locking or repose by means of their radial surfaces; these teeth may also have slight slopes.

The action of the escapement is produced as follows:—When the balance U moves in the direction of the indicating arrow, the spring takes the star B in the same direction until the stone S' comes to the position of the surface of the incline of the tooth *h* of the wheel H. At this moment the resting plane of the stone S leaves the tooth r^2 of the wheel of arrest R, the wheels turn in the direction indicated by the arrow, and the tooth *h* performs the lift or impulsion, that is to say, that it repels the stone S', making thus the star B turn in the opposite direction to that indicated by the arrow, and augmenting in this manner the tension of the balance spring. The balance then oscillates freely, and the second unlocking takes place on its return, at the moment when it comes into the position of repose in the opposite direction to the arrow. The stone S' leaves the tooth *r* which rests upon it, and the tooth h^3, by its incline, acts upon the stone S and the star, and augments anew the tension of the balance spring. This action is renewed at each oscillation of the balance. Besides the two wheels H and R, there is a third E on the same axis. This last actuates a small fly, W. It results that the escapement acts without any jolt, because the teeth of arrest fall upon the surfaces of repose with the greatest gentleness.

Fig 1b

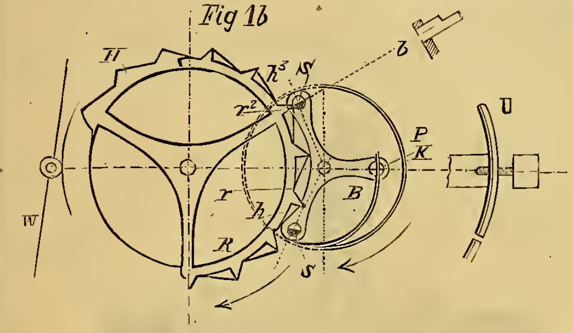


Fig.3

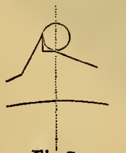


Fig.2

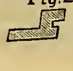
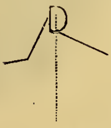


Fig.4



The unlocking produces a resistance which may be reduced by turning the stones S and S' in their sockets. The resistance may thus be completely annulled without danger of a violent disengagement, seeing that the balance spring continually presses with all the force of its tension the locking stones against the wheel of arrest.

In place of the two wheels H and R a single wheel may be employed in which the impulse teeth and the locking teeth are in different levels (*see* Fig. 2).

In many cases it will be convenient to employ a single wheel (for ships' timepieces, etc.); its teeth will be at the same level, and the cylinders of stone (or the steel pins) of cylindrical form the whole of their length.

The teeth will have then the form shown in Fig. 3; in this case the cylinder S may be also reduced a fifth part of its diameter (Fig. 4), in order to have the power of regulating in a simple manner the resistance to the unlocking. In place of the stones S, S′, little rollers may be employed, so as to change the sliding friction into rolling friction.

II.—Application of the Escapement to Clocks with free Pendulum.

The escapement described above and represented in Figs. I *a* I *b* may also be applied to clocks. Instead of the stud it is the suspension of the pendulum that is attached to the third arm of the lever, which has somewhat the form of an anchor. It is well to form the horizontal axis of rotation of the anchor with the edge of a knife which should not be too sharp. The figures 5 *a* and 5 *b* represent the escapement applied to a seconds pendulum.

The axis of rotation *a a* of the anchor A is formed by the edge of the steel prism M M, which rests upon the agates or onyxes P P; *i i* is the suspension spring of the pendulum, *o* is a little wedge which allows of the height of the pendulum being altered a little. The screws v, v^1, v^2, permit of readily adjusting the depth of engagement of the anchor.

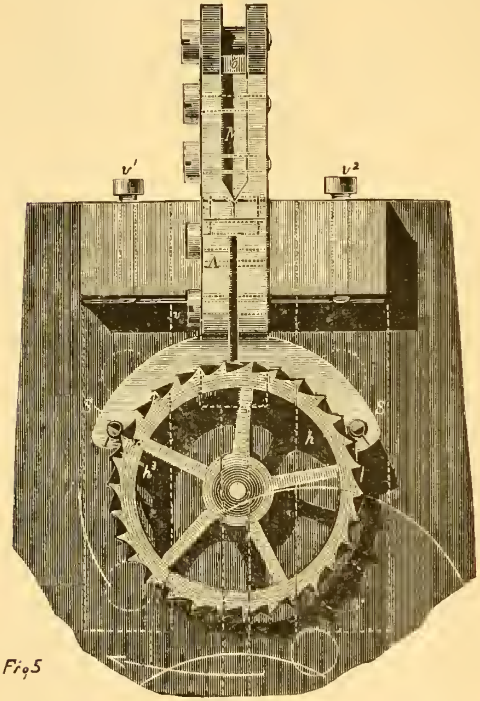


Fig 5

The active length of the suspension spring of the pendulum is variable by means of the clamps K, which allow of ascertaining the length at which the oscillations are isochronous.

The action of the escapement is as follows:—

When the pendulum is set in motion in the direction of the arrow (Fig. 5 *a*), the anchor moves in the same direction until the pallet S′ is placed against the surface of the lever *h* of the wheel H; at the same instant the pallet S leaves the tooth r^2 of the wheel R, the wheels turn in the direction of the arrow, and the tooth *h* effects the lift, repulsing the pallet S′, and thus turning the anchor in the contrary direction to that of the arrow, *and in this way increasing the tension of the suspension spring of the pendulum*, which gives it the force necessary to continue its oscillations. This operation is renewed alternately at each side of the anchor, at each oscillation of the pendulum.

If, instead of the spring suspension of the pendulum is chosen the knife-edge suspension, which is not yet completely abandoned, the unlocking is effected by reasons of the lateral traction of the pendulum when it moves in the opposite direction to that of the arrow. The transmission of force is made then because the point of suspension of the pendulum, which is higher than the axis of rotation of the anchor, is put in motion in the opposite direction to that of the oscillation of the pendulum after the unlocking.

This escapement has been made hitherto to a marine chronometer, a watch, and an astronomical clock. It will be soon applied to an ordinary clock.

The little duration of the observations does not permit of a definite judgment; nevertheless the results obtained up to now fully justify all hopes, and seem to respond to the general expectation with regard to the perfectly free balance.

The application of this escapement to watches is so much the more advantageous in that, from the model, its manufacture is extremely simple and easy, and that the balance will not set, and is put in motion when the main-spring is wound up ever so little.

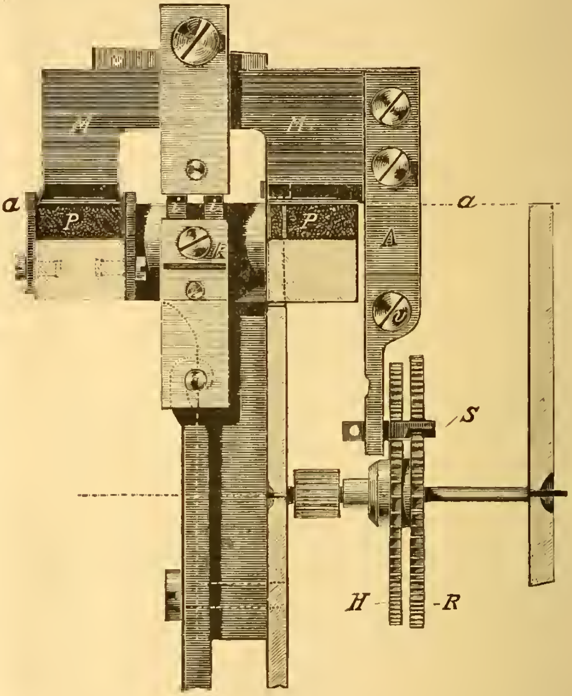


Fig. 6b

Another advantage it possesses is that over-banking of the balance is absolutely eliminated.

But the application of the escapement to ordinary clocks will be incontestibly advantageous, because the pendulum will be quite free. On the other hand, it behoves us to know if this circumstance has truly, for clocks of precision, the importance that is given to it theoretically, because the clock escapements with pendulums nearly free, of hitherto known construction and based without any exception upon the direct movement of the pendulum, has not always given the precision desired.

It is yet impossible to say actually with certainty if it will be the same for this escapement, in which the conditions are essentially different, inasmuch as the movement is made by the intermission of the suspension spring and that the pendulum is totally free.

Samson Agonistes.—*Ethel:* "Haven't we been quiet, Auntie? We've been playing Samson, and Bertie has broken the chain over his arm six times." *Auntie:* "That is nice; but where did you get the chain, darling?" *Ethel:* "We found it on your dressing table, Auntie. It's your watch chain!"—*Funny Folks*

Coin.

PHIDON, King of Argos, first coined silver 869 before Christ, and silver money was coined at Rome 269 before Christ. Before this, brass money was used, which would show there was no correspondence with the East, where gold and silver were used long before.

Coin was first used in Britain 25 before Christ, and in Scotland gold and silver coin 223 after Christ. It was first made round in England in 1101. Silver halfpence and farthings were coined in the reign of John, and pence were the largest current coin. Seven shilling pieces were issued in 1797.

Gold was first coined in England in 1087; but not again until 1345. Guineas were coined in 1673. Broad pieces of gold were called in by the Government and coined into guineas in 1732. Five shilling pieces and threepenny pieces in gold were issued in 1716 and 1761.

Copper money only was used in Scotland and Ireland in 1399.

Groats were first coined in Bohemia in 1301, and groats and half-groats were the largest silver coins in England in 1531. In 1347 a pound of silver was coined into 22 shillings; in 1352 a pound was coined into 25 shillings; in 1414 it was increased to 30 shillings; in 1500 to 40 shillings; and in 1530 to 62 shillings.

Shillings were coined in 1068; crowns and half-crowns in 1551.

The first legal copper coin was introduced in 1609, which put an end to private leaden tokens universally practised, especially in London; but copper money was introduced into England by James I. in 1620.

Milling coin was introduced in 1662, and half-pence and farthings coined by Government August 16th, 1672. Half-pence were issued for the Isle of Man by England in 1786.

The money coined in England since the beginning of the reign of Queen Elizabeth, including the debased silver of the three preceding reigns, up to the year 1793, was as follows:—

By Queen Elizabeth	£5,832,932	
„ James I.	2,500,000	
„ Charles I.	10,499,544	
„ Cromwell	1,000,000	
„ Charles II.	7,524,105	
„ James II.	3,737,637	
Before the Revolution ...	————	30,094,218
„ William III., including re-coinage	10,511,963	
„ Queen Anne	2,691,626	
„ George I.	8,725,921	
„ George II.	11,966,576	
„ George III., up to 25th March, 1793, including re-coinage	51,073,362	
	————	110,969,448
		£141,063,666

Of this £141,063,666 sterling there were £32,000,000 in silver long before the Revolution. The whole gold coinage did not exceed £6,000,000, all payments till then being mostly made in silver. The nature of the coinage changed, however, during the reign of George III., when the whole of the silver coinage amounted to £63,101.

The coinage of gold and silver in the four years 1793-97 amounted to £6,191,825, of which—

	£	s.	d.
In 1793 was coined	2,747,430	0	6
1794 „	2,553,894	12	0
1795 „	497,711	5	6
1796 „	391,789	2	0
1797 „	2,000,297	0	0
	£8,192,122	0	0

Equation of Time.

GERMAN newspapers contain expressions of dissatisfaction from German scientific men that no effect has been given to the recommendations of the Geographical Congress, held at Rome in 1883. The Congress pointed out the very inconvenient and startling anomalies as to the days of the week and month occurring in the Western Pacific and the islands of the Indian Seas. The great majority recommended that all time should be reckoned east and west from Greenwich, noon at the Observatory being the fixed point from which time should be counted. Thus, for every place within 180 degrees east from Greenwich it was still to be Monday, when it was noon on Monday at Greenwich; and similarly it would be the forenoon of Monday for places within 180 degrees west. A special regulation was to be made for the places lying near, on either side of the meridian 180 degrees, to obviate plain difficulties. As a specimen of the anomalies at present existing, the case is cited of Sydney, in Australia, where it was two o'clock in the morning of Wednesday, New Year's Day, 1890, at the moment when at Manila it was about four minutes past midnight in the morning of Tuesday, December 31, 1889; or, to bring the absurdities still closer together, when it was half-an-hour after midnight in the morning of the last day of 1889 at Spanish Manila, the New Year's morning of 1890 had just begun at Portuguese Macao, only six degrees more to the north. It ought not to be impossible to harmonise those strange diversities of time.

Watches and Watchmaking.

THE interest with which certain home experiments in the watch factory direction are being watched, will make the following contribution to a contemporary regarded as, to say the least, timely and to the purpose:—

It is now just 39 years since Mr. Dennison and Mr. Howard began to prepare for their experiment of making watches in Boston. Although not an excessively long chapter in the world's history of watchmaking, four decades is quite a stretch in the business experience of individuals, and we are led to inquire what achievements have been made during this period.

Emphatically it has been an era of improvement in tools and methods of manufacture resulting in a fabulous growth of business, and an equally fabulous reduction in the cost of watches, and still the business is immensely profitable. Recognising the value of improvements in manufacturing, we naturally look for corresponding improvements in the construction of watches—improvements that tend to their betterment as time-keepers. We find the safety pinion a valuable contribution, but it adds nothing to time-keeping properties. A variety of designs for both full and three-quarter plate work have been made, but design of frame does not ensure correct construction.

At one time a kind of regulating stud was patented and applied to a few watches, probably with the expectation that it would revolutionise things. Had the inventor known about isochronism, he would have saved himself the trouble of an experiment—in fact, would not have allowed his wonderful incubation to escape the shell.

Another improvement (?) is putting the straight line escapement in full-plate frames. The benighted foreigner, who has given us all the escapements, would never have risen to the sublime height of this innovation, and probably it was not the conception of a watchmaker anyway.

Doubtless this construction leads to more damage in handling, certainly to more vexation, than all other styles combined, and if practical men would condemn to the extent of refusing to handle them, they would soon be driven from the market. But full-plate watches are old fogy and should be abandoned. Three-quarter-plate watches are better and much more desirable than full-plate, but should be so constructed as to permit a full and free view of the escapement. As made now, the escapement in most of them is about as inaccessible to vision as in full-plate work.

When we have watches that are constructed on scientific principles, we will have time-keepers without the tedious, uncertain, and expensive process known as "adjusting" (except compensating), and they will be more reliable for pocket use. Adjustors may dispute this, but it is a fact, nevertheless.

People not familiar with watch factories will wonder that improvements in the watches have not been commensurate with improvements in tools. A short residence in a factory will suffice to solve the problem.

Some Old Jewellers of New Orleans.

SINCE the days when New Orleans began to receive into her lap the generous yield of that land which is so bounteously watered and enriched by the Mississippi and its tributaries, she has, says Mr. Jno. K. Allen in the *Jeweller*, always demonstrated the wisdom of Bienville which led him to found the city and to counsel the removal to it of the seat of government of the French colony. Her commanding position at the foot of our mightiest river has been maintained through discouragements which would have defeated less hardy pioneers, and at a cost about which too many may justly complain. Its seat of imperial authority in trade matters in the South, however, has never been resigned to any other city, and, at the present time, her citizens are very hopeful for her future. The fact that New Orleans has been the largest cotton and sugar market and the leading depôt in plantation supplies, has drawn to it all the trade of the rich planters of the South, both before the war and since, for all the refinements with which they made their homes attractive and with which their beautiful wives and daughters adorned their persons. Hence the retail jewellery trade and its allied lines have always been important features of New Orleans business.

During a brief visit, made just before Christmas, to that city of sunshine, gardens and flowers, I called upon a few of its many jewellers. The trade preliminary to the holidays was at its full height, and brief interviews were necessary if held at all; and right here let me say that if Christmas trade all over the country was as good as at New Orleans, the retail jewellers will have little to complain of.

One naturally turns to the beautiful store of A. B. Griswold and Co., at the corner of Canal Street and Rue Royale, as the leading jewellery store in New Orleans. The location is a most excellent one, being under the shadow of the Clay monument, around which all the street cars and other transportation lines centre. Here, with customers several rows deep, I snatched a few words from Mr. Abbott, who has been a long time with the house, and who looks, by the way, much like the late Henry Ward Beecher. This house is, I think, the oldest one in business in Louisiana, having been established in 1817 by Hyde and Goodrich on Chartres Street, then one of the principal streets of that portion of the city now known as the French district. This firm continued in trade until 1856, when the style of the firm became Thomas Griswold and Co. At the close of the war—and let me say the business men of New Orleans who were not ruined by the war were few in number—Thomas Griswold died and the firm became A. B. Griswold and Co. This firm shows a fine line of silverware, bronzes, clocks, watches, gems and jewellery, and enjoys a large trade. In the olden times they did about all the business in New Orleans, but now they are pressed very closely by the enterprising house of M. Scooler.

I found Mr. Scooler, the senior member of the firm, in a very happy frame of mind over the Christmas trade which his house was having. He informed me that he established the business in 1842, and had been in business continuously since. He has admitted his son, I. Scooler, and his son-in-law, I. Lowengardt, into business with him, but the style of the firm remains unchanged. Their place of business is at 103 and 105, Canal Street, in the busiest part of that busy street, and in the well-arranged show-cases is shown a beautiful stock of diamonds, watches and jewellery. Mr. Scooler informs me that he imports his own bronzes, going abroad annually for that purpose. They carry an extensive line of silverware and clocks, and are sole agents for Patek, Philippe and Co.'s watches.

The lover of the old French quarter of New Orleans will not permit the gay and lively promenaders on Canal Street, or the brilliant stores which line both sides of that wide thoroughfare, to engross his sole attention, but he will turn from Canal into that narrow and badly paved street which the weather-beaten signs at the corners tell you is Rue Royale, and which leads into the very heart of what is still an essentially French district. The overhanging balconies, thronging with a foreign domestic life, the closely battened doors and windows, the open driveways leading into paved and shaded courts with enticing green plants and spray-like fountains, all speak in a language very foreign to our American ears. The traveller who is looking for interesting things in the jewellery line will find them here. Little shops presided over by grizzled and moustached Frenchmen, display queer trinkets, old stones taken from dismantled jewellery, old watches undergoing repairs, and other evidences of a trade not well nourished. On the right side of the street, No. 60, your attention will be called to a projecting iron bracket bearing a double dial clock, on the top of which is a bell. Seated on the bell is a representation of a human male figure bearing a hammer with which he strikes the hours. On the wall will be seen another dial, both this and the outside clock being operated by works of a very high character which are visible from the street, a plate of glass set in the wall in the second storey permitting them to be seen. This useful and unique advertisement attracts the stranger's attention to the store of E. Barbier, successor to S. Fournier. Going inside you may be met, as I was, by a beautiful, dark-eyed French lady who will inform you that Mr. Barbier will be in in a few minutes, and if you sit down to wait for his return you will allow your eyes to wander over a modern and well-kept stock of watches, clocks, diamonds and jewellery. When Mr. Barbier comes in, as he will in a few minutes, you will find him a pleasant gentleman, and possibly the only jeweller in the United States who now owns the business in which he learned his trade. Mr. Fournier came from France and established this business in 1846. In 1853 Mr. Barbier entered as an apprentice, and ultimately succeeded to the business. It is an interesting fact that this house began the manufacture of tower clocks in this country. The Howard and Thomas companies had not begun their manufacture, and such movements as were in the country were imported. This house constructed the first ones made in the United States, and examples of their handiwork are common in New Orleans. The excellent clock in the quaint old cathedral of St Louis is an example of their work, and another is the clock now at the Hospital, but formerly on the Hotel Royale, when it was called the St. Louis Hotel, a beautiful building, possessing more historic interest than any other American hotel.

We now leave the old portion of the city and cross Canal to No. 8, Camp Street, to visit the Nestor of the New Orleans jewellery trade, Mr. H. P. Buckley. Mr. Buckley humorously says, in reply to our query, that he has been in New Orleans about a hundred years, more or less. As he is a hearty and well-preserved gentleman, we express some surprise that time has dealt so gently with him, when he replies that it ought to, as he has always been gentle with Time. This delicate allusion to his deftness as a watchmaker is ingeniously made. Mr. Buckley put out his sign in 1853, though he was in New Orleans long before that. He carries a general line of jewellery and watches and reports a satisfactory business.

Going back on Canal Street to No. 115, we enter one of A. M. Hill's stores, the other being at 84 and 86, St. Charles Street. Mr. Hill is too busy to talk, but a few well-directed questions elicit the information that he came to New Orleans after the war and cut stencils, repaired gold pens, and did such work until he secured an opening in business, since which time he has built up a large business and acquired a fortune, it is said, of 250,000 dols.

Mr. Hill has a general reputation for keeping "standard time," and this, as every jeweller knows, is a very enviable reputation to possess.

It would not be a fair review of the jewellery trade of the city of New Orleans were we to omit mention of the firm of Leonard Krower and Co., of 31, Chartres Street, the only firm in the South, we are told, which combines manufacturing with jobbing. A call upon these gentlemen showed that the busy season was still with them. We were informed, however, that their business during the year has been a very successful one, and they are obliged constantly to enlarge their facilities. Among the novelties they have brought out was the very successful cotton-bale clock. This firm extends a hearty invitation to all jewellers who may visit New Orleans during the great Sængerfest to make their headquarters at their very convenient store.

My judgment, formed after these interviews with representatives of the business in the South, leads me to state that trade in that section is in a prosperous and promising condition, and I am confident that jobbers will be called on largely to increase their sales in the South in the near future.

Celebrated Rings.

THERE is scarcely any limit to the amount of writing that this subject suggests ; it is as endless as the article itself. But a special chapter in the history of rings has lately been opened by the discussion going on as to the genuineness of the Essex ring now to be seen at the Tudor Exhibition. On this subject a contemporary observes that with the cold-blooded attempt to prove the whole story a myth it has no sympathy whatever. The touch of genuine feeling which it reveals in the character of "good Queen Bess" is too precious to be extinguished by the unbelief of any *savant*, however learned. The question as to which is the genuine article of the two chief claimants to the honour is another matter. So long as we have the romantic story left to us, we can engage with a light heart in the discussion as to the true identity of Queen Elizabeth's token of affection. The ring exhibited in the New Gallery is a cameo representing a portrait of the Virgin Queen in a high ruff. The inside is enamelled in blue and gold, and we are told in the catalogue that it seems to have been originally made for a very small finger, such as in common gallantness we may imagine Her Majesty to have had, and to have been subsequently enlarged. At the present moment it is the property of Mr. F. J. Thynne, and it has descended to him in unbroken succession from Lady Frances Devereux, daughter of the Earl of Essex. The only link wanting in the chain of evidence to prove it the really historic ring it claims to be is how it came into the possession of Lady Devereux. There are many versions of the story as to the manner of its miscarriage when sent by Essex from the Tower. That given by Mr. W. Jones, F.S.A., in his work on "Finger-ring Lore," may, perhaps be taken as the most reliable. He says when Essex was under sentence of death he determined to try the value of the Royal talisman. Knowing he was surrounded by open and secret enemies, to none of whom he could trust such a precious token he had recourse to stratagem. Seeing a boy pass beneath his prison window, whose face he liked, he threw the ring to him, and bribed him to take it to his cousin Lady Scroop. The boy by mistake took it to her cruel sister the Countess of Nottingham, and as both ladies belonged to the Royal bed-chamber the mistake might easily occur. How the Countess suppressed it and kept the secret until she revealed it on her death-bed to Elizabeth we all know. But what we do not know is whether the Queen, when she left the room in a fury at the deception that had been practised on her, took with her the unfortunate ring, or left it in possession of the dying Countess.

We like to believe that the unfortunate miscarriage of this ring cost the Earl of Essex his head, and having this faith, we are naturally very anxious to do reverence to the precious token if it exists. Mr. Sydney Lee told us the other day that the whole story is apocryphal, and that it had its origin in a so-called history of the Queen and her favourite ; but we are not going to lose this pretty bit of romance in deference to a hundred Mr. Lees. With far greater pleasure we listen to what Mr. Herbert Grueber has to say. Writing from the British Museum, this gentleman points out that there is documentary evidence to prove that the story connected with the ring in the Tudor Exhibition was related by Lady Spelman, the great grand-daughter of Sir Robert Carey, the Countess of Nottingham, and others. The ring must have been given to Lady Frances Devereux either by a member of the Nottingham family, or possibly by Queen Elizabeth herself. Birch's "Memoirs of the Peers of England during the reign of James I." cannot be looked upon as a worthless authority ; and he states that Lady Elizabeth Spelman repeatedly told the story of the Devereux ring. The rival claim of the Warner ring does not rest on so good a foundation. It is stated to have been originally given to Elizabeth by Mary, Queen of Scots ; but, whereas, the Devereux ring is a cameo of the sixteenth century, that possessed by the Warner family belongs to a later period. An entry in "Manningham's Diary," 1602-1603 (Camden Society), is distinctly confirmatory of the existence of an Essex ring : "Dr. Parry told me the Countess Kildare assured him that the Queene caused the ring wherewith shee was wedded to the Crowne to be cut from hir finger some six weeks before hir death, but wore a ring which the Earl of Essex gave hir unto the day of hir death." So that, on the whole, visitors to the Tudor Exhibition may gaze with a clear conscience on the romantic relic which is numbered 1031 in the catalogue, and picture to themselves, if they can, the various emotions to which its existence gave rise long years ago. One thing is certain, Queen Elizabeth was fond of the use of rings as pledges, as witness the frequent interchange between her and Mary Queen of Scots. The latter, after leaving Scotland, says Miss Strickland, to throw herself on the protection of Elizabeth, sent a ring as an *avant courier* with a letter which concluded thus :—"To remind you of the reasons I have to depend on England, I send back to the Queen the token of her promised friendship and assistance." But Elizabeth was fonder of giving tokens of love and friendship than of redeeming them, as poor Mary found to her cost. This particular ring is described as being a delicate piece of mechanism, which was in several joints, was so made as to represent two right hands supporting a heart, formed of two diamonds held together by a spring, which, when opened, would allow either half to be detached. Aubrey says, "Queen Elizabeth kept one moietie, and sent the other as a 'token' of her constant friendship to Mary, Queen of Scots, but she cut off her head for all that." Even token rings cannot always be relied on.

To specially bequeath rings to relatives and friends was at one time a much more common practice than it is now. In old days when the ties of blood and friendship were for the most part held as sacred, a ring to keep green the memory of a loved one was the orthodox gift of a dying man. Thus Shakespeare in his will leaves money for the purchase of rings by his friends. Two of his townsmen have each twenty-six shillings and eightpence left them "to buy them rings ;" while three others, actors—"my fellows," as he calls them—are to receive a similar amount for a like purpose. Izaak Walton left each member of his family a ring with a motto, "Love my memory ;" whilst to the Bishop of Rochester he sent one having "A mite for a million" engraved on it. As may naturally be expected, living in this age, Pepys would hardly be left behind in this particular. In an appendix to his "Diary" is a long list of the persons to whom mourning rings were presented on the occasion of his funeral. They numbered 128 in all, and cost him from 10s. to 20s. each. George Washington was particular in his bequest of certain rings, as also was Nelson. Of the rings still extant that were gifts of Charles I. there are a great number. One presented by the unfortunate monarch to Sir Lionel Walden on the morning of his execution, bears a miniature likeness of the King, set in small brilliants, with the motto "*Sic transit gloria mundi.*" An interesting token ring given by Charles II. to the Penderell family for concealing him in the oak at Boscobel was shown at the loan exhibition, South Kensington, in 1872. It is made of silver, set with a yellow topaz, diamonds, and a small ruby of English manufacture. Lavish as His Majesty was in the distribution of rings, the one he gave from off his royal finger to the brutal Judge Jeffreys before he departed on his tour of judicial murder, obtained a sinister notoriety amongst his subjects at the time, who called it "Jeffrey's bloodstone." How many rings, we should like to know, have been first swallowed by fishes, and then miraculously restored to their owners. The story has come down from the days of King Solomon, whose preternatural wisdom was, according to Hebrew tradition, as related by Josephus, all owing to his signet ring. One day a Jewess stole it while he was in his bath, and threw it into the sea. For forty days Solomon was nowhere as a magistrate, and he therefore was absent from the judgment seat. Luckily in a fish served for his dinner was found the missing ring, or we might have had to go without our Proverbs. A correspondent of *The Standard*, who once asked to see the nuptial ring of the Virgin Mary, said to be kept in the Cathedral of Perugia, had to wait till St. Joseph's Day, when it was exhibited on high. He describes it as a plain gold ring, large enough for any man's thumb, and in no wise worth seeing. What ring is, unless it has an undoubted and memorable history?

Pawning the Crown Jewels.

THE pawnshop is commonly supposed to be the peculiar heritage of the poor; but the side lights which the police, divorce, and bankruptcy courts sometimes throw on the life and doings of the higher orders, show that the latter do not despise that vulgar refuge when necessity compels. And even the monarchs of this august realm of ours, when they have wanted money to prosecute their wars or their intrigues, have almost invariably found that they could do it in a neater and quieter way by pledging the crown jewels than by laying an extra tax on the people. The Plantagenets, Lancasters, Tudors, and Stuarts, who all rejoiced in a plethora of jewellery and plate, all—not every member, but most of the members of every house—did it. Henry III., when he began to quarrel with his nobles, provided against probable contingencies by confiding his jewels and plate to the care of the Queen of France; and when the successful rebellion of the barons under Simon de Montfort made money a scarce commodity with him, he was able to obtain a good supply from the merchants of France, on the security of his valuables, which, however, he left his son and successor, Edward I., to redeem. Edward, "the greatest of the Plantagenets," although he was forced, at a crisis, to renounce taxation without the consent of the nation, yet contrived to manage his affairs so well that he was never reduced to the indignity of pawning his crown jewels—of which he had a goodly store, possessing no less than four crowns, all set with emeralds, rubies, sapphires, and large Eastern pearls. Edward III. was compelled to appeal to the Flemings for "the sinews of war," and to deposit his crown and sundry jewels as security in return. His grandson got possession of them again, but only to consign them to the Bishop of London and the Earl of Arundel in consideration of a loan of £10,000. Shakespeare makes Bolingbroke's adherents assert that the proud rebel returned to England to "redeem from broking pawn the blemished crown." Richard II. was so hard pressed that he had even to pawn his favourite ornaments, "his jewelled white harts." Henry IV. managed to keep clear of the pawnbrokers, but his greater son, Henry V., could not manage to do so. He wanted money for a great object—the prosecution of his claim to the crown of France—and raised part of the funds by pawning his "Rich Collar" (valued at £2,800) to the mayor and mayoralty of London; and his Skelton Collar, garnished with rubies, sapphires, and pearls, to the Bishop of Worcester, of the city of Coventry. The first he redeemed, but the other was in pawn when he died in 1422. The unfortunate Henry VI. was forced again and again to raise money on the security of his jewels. In 1439, he borrowed 7,000 marks from his uncle (in a double sense), the Cardinal Bishop of Winchester, depositing with that wealthy ecclesiastic the Rich Collar (upon which his father had obtained 10,000 marks); a gold sword, garnished with sapphires; three gold tablets—of St. George, Our Lady, and Christ's Passion; a great alms-dish, "made in maner of a shipp full of men of armes feyghtyng upon the shipp side"; the Sklyngton Collar; and various chargers, chalices, dishes, pots, etc., etc., the condition being that all the articles were to become the property of the bishop if not redeemed within twelve months' time. A few years later, Henry handed over to the Earl of Buckingham, as security for the payment of himself and his soldiers for services rendered in France, two gold basins, a gold tablet, and a little gold bell.

For two or three reigns following that of the last of the House of Lancaster, the crown jewels seem to have been kept for their proper use; indeed, Elizabeth lent money instead of borrowing, and at her death left behind her a cupboard full of plate belonging to the House of Burgundy, which she held as security for advances made to the States of Brabant. But such a solitary example could not find imitators, and we have James I., in the year 1617, appealing to the aldermen of London for a loan of £100,000 (part of the anticipated cost of his progress to Scotland) on the crown jewels, and becoming very much offended at their refusal to oblige him; however, he contrived to raise £60,000 on them in some other quarter.

Two years later, when about to make another progress (these progresses of his were vastly expensive affairs), he had to go again to the pawnshop. Chamberlain, writing to Sir Dudley Carleton, that the King intends making a "petty" progress to Otelands, Oking, and Windsor, says:—"We are driven to hardships for money, and all too little, so that we are fain to make sale of jewels for twenty thousand pounds to furnish out this progress;" but it seems that on this instalment—they were the Queen's jewels this time—Master Peter Van Lare would not advance more than £18,000; and Chamberlain consoles himself with the reflection that "the choice of pearls and other rare jewels are not touched, among which there is a casquenet of round and long pearls, rated at forty thousand pounds—in the judgment of Lord Digby and others, the fairest that are in the country."

Charles I., worthy son of a worthy sire, followed in that sire's footsteps, and when he wanted to raise money, sought to raise it upon the crown jewels. In the very first year of his reign he overhauled the Jewel-house to see what articles therein contained he could most conveniently transfer to the Duke of Buckingham, about to proceed as ambassador to Hague, where his Majesty hoped to be able to borrow a few thousands. Such a clearing did he effect that before long all the jewels and gold plate of any value had left the care of the Master of the Jewel-house. Sir Henry Mildmay, who, writing to the King to inform him of this fact, said that if his Majesty wanted anything more, he must perforce be contented with silver plate, as there was nothing else left in the Jewel-house.

Buckingham as soon as he set foot in the Netherlands, commissioned a Mr. Sackville Crow, and one, Philip Calandrini, to raise £300,000 upon two parcels of jewels, and one parcel of gold plate set with stones. The Dutch merchants asked for a guarantee that the jewels should be redeemed within three years—which was not quite practicable, and after four months spent in negotiating the affair, Crow declared that he had little hope of doing any good, and rumours of difficulties between Charles and the Commons coming over "in such a full stream as to carry away all hope," he was forced to return to England with the greater portion of his precious charge. His fellow-agent was more successful, and did manage to raise £58,000 upon certain other jewels, for the interest on which sum we find a warrant issued in 1628 for £3,000. Twelve months later, Calandrini writes to Secretary Dorchester that his brother has written to him from Holland "that those who have the pearls in hand, and also the Widow Thibaut, who has his Majesty's jewel of the Three Brethren, will not wait any longer, but will proceed to execution before March;" and begs the Secretary to prevent the damage and dishonour which will be caused by delay in redeeming the jewels. Charles himself then took the matter in hand, and gave instructions for the sale of four thousand tons of iron ordnance to the States-General for £120,000. With this sum the plate and jewels pledged in Holland, and "the collar and rich balhasses" pawned to the King of Denmark for £12,500 were redeemed. In 1631, again, we find warrants granted for nearly £20,000 to redeem other Crown jewels held as security for loans by Dutch merchants; and some remained in pawn as late as the year 1635, when Boswell and Geraerd were employed to recover them.

Not content with pawning the crown jewels, Charles now and again took a survey of the regal ornaments remaining to him, and sold all those he thought he did not actually want for use. Thus, he took away from the Secret Jewel-house in 1629, a large agate, engraved with the portraits of Henry VIII. and Edward VI.; and at the same time ordered the sale of sundry articles of more or less value, including four gold collars, twelve pieces of goldsmith's work like friars' knots, with ninety-one pendant pearls; a circlet of gold, "new made for our dear mother, Queen Anne, having in the midst eight fair diamonds, eight fair rubies, eight emeralds, and eight sapphires, and garnished with thirty-two small diamonds, thirty-two small rubies, and sixty-four pearls, and on each border thirty-two diamonds and rubies;" and a girdle of rubies in the form of red and white roses. In the year following this grand clearance, we find Charles accepting £1,108 from James Maxwell, and in consideration of that sum, authorising him to retain as his own property, two large diamonds upon which he had previously advanced £11,346; and this is but a sample of many similar arrangements between his Majesty and the goldsmiths But the climax was reached in 1642, when both King and Parliament were preparing for war, and when Charles authorised Queen Henrietta Maria to dispose of his great collar of rubies, and sundry other jewels which she had conveyed abroad, to raise funds for providing arms and ammunition for his adherents. Parliament, when the fact became known, issued an order of the day, declaring that Charles had no power to pawn or sell the crown jewels, and further, that "any person who had, or should pay, lend, send, or bring any money into the kingdom for or upon those jewels" was an enemy to the State, and was punishable accordingly. The Commons, however, though denying this right to the King, arrogated it to themselves, and in the same year authorised Henry Martyn to break open the Royal Jewel-chest at Westminster, and sell the contents, among which were King Edward III.'s crown, King Alfred's crown, Edward VI.'s and Queen Elizabeth's crowns, as well as a number of sceptres. The consequence of this was that on the Restoration a new set of regalia became necessary, and cost the country £31,978 9s. 11d. Charles II. in a small way, restocked the Jewel-house, and since then the crown diamonds and jewels generally have remained unmolested.

M. R. D.

Important Watch Trade Case at Prescot.

ON Tuesday, February 18, at the Prescot Police Court, Edward Porter, watchmaker, was sum-by Mr. James Berry, trading as Isaac Hunt and Co, watch movement manufacturers, for leaving his employment without notice. Mr. J. O. Swift, St. Helen's, appeared for the complainant, who claimed 11s. as damages, and Mr. Segar, barrister, instructed by Mr. W. Tyrer, solicitor, Prescot, represented the defendant. It appeared from the statement of Mr. Swift that the defendant had been in complainants employ for a considerable period, but left on Saturday, the 1st instant, without given a seven days' notice, to which he (complainant) considered himself entitled. Mr. Berry gave evidence in support of Mr. Swift's statement, and added that on the Monday after defendant had left he heard he had started for the Lancashire Watch Company at Prescot. He accordingly wrote to the defendant, stating that though he had a perfect right to do what he liked with regard to his own labour, he should have taken the honourable course of serving a week's notice as required by the rules of his factory. To save any unpleasantness he must ask him to serve the notice, or to pay a week's wages, as he was sure the Watch Company had no wish for him to leave his employment without a proper legal notice. He had not received any reply to that, nor had the defendant returned to his work. In reply to Mr. Segar, witness said several of the employers in Prescot had joined the new Watch Company. Mr. Segar: And naturally there is a certain amount of competition and rivalry between your firm and the Lancashire Watch Company? Witness: There is just the ordinary competition of trade. I don't look upon them as very great rivals, because I think there is sufficient to do for both of us. Mr. Segar: Would these proceedings have been taken if it had not been for this rivalry? Certainly; on public grounds I take these proceedings. After other witnesses had been examined, Mr. Segar submitted that his client gave a formal week's notice to complainant's foreman, and that the claim for damages had not been fairly made out. After a long hearing the bench stated that they had carefully considered the matter, and they considered that Porter did not give the required seven days' notice, and that Berry consequently was entitled to damages claimed.

There were three other cases, in each of which £1 damages were claimed by Mr. Berry, and, after a consultation, it was decided that these should be jointly heard. The defendants were named Thos. Dyson, James Pickavance, and Joseph Lyon. Mr. Swift explained that in this case the defendants, who were then in the employ of the Lancashire Watch Company, visited Mr. Berry's house, and, after some conversation, signed agreements to enter his service on certain terms for a period of six months. But they failed to appear at the time agreed upon, and after a lot of correspondence these proceedings were instituted. Mr. Swift added that his client on the strength of the agreement lent two of the defendants sums of money to be repaid by weekly instalments. The defence, he understood, was that the men were drunk when they signed the agreement, but that statement was, he contended, unfounded.—Mr. Berry gave evidence, and in reply to Mr. Segar, strongly denied that any drink was supplied to the defendants at his house before they signed the agreement. A drop of whisky was given to each man when they had signed. None of the men had worked for him; they were now employed by the Lancashire Watch Company. The signing of the contract had nothing to do with the drink. Men who performed work similar to that of the defendants were very greatly in request. He did not offer them an advance of wages if they would leave the Lancashire Watch Company.—Before the defence was entered upon, a consultation took place between the parties, as a result of which Mr. Segar informed the bench that he did not object to the men going back to Mr. Berry's employ, but they certainly did protest against the underhand methods adopted and suggestions made to them.—Mr. Swift said that was just the complaint he had against the Watch Company. The Company knew when they took the men and got them to enter into a twelve-months' contract they had signed for six months to Mr. Berry.—Mr. Segar: But they were then in our service.—Mr. Swift: The defendants admit the claim for damages, and in lieu of taking an order we ask your worships to direct them to enter into their own recognisances to complete their contracts; and under these circumstances we don't seek to enforce the payment of damages.

The cases, which had lasted several hours and were listened to by a large crowd of persons connected with the trade, then terminated.

The late Mons. Phillips.—"We have to note, and we do so with sincere regret," says the *Journal Suisse d'Horlogerie* "the death of the savant Phillips, the engineer so well known to watchmakers by his many works, notably by his study on the terminal curves of the balance-spring. It is he who was elected to the presidency of the Chronometrical Congress held at Paris last year, and of which the account is scarcely more than a few days old. It may be said indeed that up to the end of his career he has rendered to the horological industry services undeniable and undenied."

The Development of the Lathe.

By Ambrose Webster.

Mr. WEBSTER, who is well known to many of our readers on this side as the head of the American Watch Tool Company, having contributed the following article on the subject upon which he, of all others, is, perhaps, the best qualified to speak, we take the liberty of reproducing it, *pace* the *Jeweler's Circular*:—There is no tool on the watchmaker's bench that is so expensive, valuable, or attractive as a nickel-plated American watchmaker's lathe. It is expensive, because in its construction, though there is a comparatively small amount of material used, a large amount of expensive labour is necessary. It is valuable because it is ready for use at a moment's notice, and furnishes the capability to polish pivots and staffs, and perform any of the numerous operations so constantly required in the repairing of watches. It is attractive through its highly-bright appearance and delicacy and beauty of form. Through this attractiveness, the lathe proves of value as an advertisement to the owner, for, when a customer, upon entering his shop, discerns the neat and trim American lathe, instead of the rough-looking affairs he remembers were universally used in his youth, he argues that the possessor of the better tools must perform the better work. The efficiency of the American lathe is undeniable; skilled workmen agree that they can do from 20 per cent. to 25 per cent. more with it than with the old styles. The best manufactures have been copied in England, France, Germany, and Switzerland.

As very few watch repairers ever consider the progressive steps in the development of the lathe from its original form used in pre-historic ages, down to its present perfect construction, I think a review of this step, in simple outline, will prove of interest and value. In the first illustration the crude, primitive lathe is depicted.* It will be noticed that the article to be turned has both its ends, or bearings, fastened in the fork of two trees, and is revolved by a crank. The operator, or turner, holds the cutting tool against the revolving object, his hands resting on the fork of a tree-branch, which is driven into the earth.

There were several minor stages between the primitive form and the ingenious Egyptian lathe; but, my space being limited, I will hurry to a description of this machine. The Egyptian lathe for centuries was in universal use; and, even at the present moment, in some out-of-the-way places still exists. It was originally made wholly of rough wood, and was composed of a spindle and pulley mounted upon a stand, looking more like the framework of the door of a log-cabin than a piece of machinery. The power for driving this lathe was as follows: a cord was at one end fastened to the pulley, the other end being tied to a branch of an adjacent tree, which was seen downward to form a spring. A pressure of the foot in the stirrup produced a forward rotary motion which was reciprocated backward by the release of the foot-pressure and the recoil of the tree-branch, the continual pressures and releases producing a constant reciprocal rotary motion. As years became generations, and generations centuries, the material used in the manufacture of these machines, as seen in the illustration, was to change to iron, the principle of regenerating power remained essentially the same, a springy pole being used instead of a tree-branch. The Egyptian lathe has entirely disappeared in America, but, as I have said, still exists in remote parts of Europe.

Until quite recent days, the fiddle-bow was almost every watchmaker's principal tool, and is now utilised by many mechanics. This was, or rather is, but a modification of the reciprocal rotary motion in the Egyptian lathe. It is too widely known to bear profitably a description at this day.

This final stage, the fully-developed machine, is shown in the last illustration, which gives an improved foot-wheel, driving to a countershaft, and from the latter to the lathe. Every watchmaker's lathe should be set up thus to exercise its full value to the workman.

To consider some of the essentials of a perfect lathe. As is known, every article turned will be of the form of the bearing of the spindle; consequently, if the bearing is not perfectly round, the article cannot be perfectly round; the shoulders of the spindle must be perfectly true, or the truth of the turned article will be affected; the spindle of the lathe should revolve with uniform freedom, and must not have hard spots during the revolution; the general use of spring chucks requires that the mouth and throat of the lathe shall be perfectly true and both hard, and that the chucks shall be hard, and ground true after hardening; the tailstock spindle should also be perfectly straight and round, and fit accurately in the hole. The process of binding the spindle must not have any effect upon its alignment; it is also absolutely necessary that the fine point of the tailstock shall accurately match and align with the point of the centre of the headstock, to secure which end very expensive tools and machines have been made, adding largely to the general cost of the lathe. The latter essential, capable of fulfilment in a lathe, proves the lathe of being perfect in construction. Some manufacturers are producing a lathe in which the tailstock may be reversed upon its bed, and either end perfectly align with the headstock.

Notwithstanding that lathes possessing the above qualities cost fifteen per cent. more than those built without particular care, the difference in the efficiency of the two varieties is a larger per cent. than that of the difference in cost. Every investor hopes for the return of a good dividend, and experience has proved that a perfect lathe pays an annual dividend of fifty per cent.

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* Unfortunately, we have been unable to get the illustrations referred to in the text engraved in time for the present No.; to most of our mechanical readers, however, the explanations will be sufficiently clear to be understood without cuts.—Ed.

The Lancashire Watch Co.'s First Annual Report.

THE directors of the Lancashire Watch Company have issued their first Annual Report and Balance Sheet to the shareholders, made up to Dec. 31, 1889, which was considered by them at the annual meeting held on Thursday, Feb. 20. The directors announce as the profit of the first year's working £3,162 15s. 0½d. Out of this it is proposed to write off £797 12s., the amount of the preliminary expenses of the formation of the company; to pay 5 per cent. interest on all moneys received from shareholders in advance of calls; to pay 6 per cent. interest on the called up capital; and to carry forward the balance of £1,190 13s. 8½d. to next year's profit and loss account.

The directors of the Watch Company, feeling confident themselves in the ultimate success of the enterprise, are urging the original shareholders to take up further shares in their own interest. If the Company can pay a 6 per cent. dividend, write off nearly £800 of preliminary expenses, and carry forward nearly £1,200 as a result of the first year's working, great things may be expected from it in future years. But it would scarcely have affected my opinion of the ultimate success of the undertaking had there been no dividend announced for the first year. Indeed, I would rather see the whole amount carried forward. The directors are, however, about to do what they no doubt consider to be in the interests of the undertaking and the shareholders.

The saying that "there is nothing new under the sun" receives fresh confirmation in the recent discovery, which is mentioned by an American contemporary, that a "nickel and slot" machine was in use in the ancient Egyptian temples. The holy water was not free to all, but was kept in a closed vessel. When the sum of five drachmæ was dropped into the top, a valve opened and allowed a small quantity of the sacred liquid to flow out, after which it automatically closed to await the arrival of the next customer.

Practical Vision-Testing.

By R. Brudenell Carter, F.R.C.S.

A Paper read before the Society of Arts.

(Continued from page 199).

NOW normal vision, as thus defined, is, for the average man, the practical limit of human faculty, and it is the business of the ophthalmic expert to declare when this limit is attained, and also by how much any given examinee may fall short of it. It is the business of the railway expert to declare what amount of vision is sufficient for his requirements. It may be—I do not say it is, but it may be—that half-vision or three-fifths vision would enable an engine driver to discharge his duties in a safe and satisfactory manner. That is for the railway authorities to decide. The man with normal vision will see a day signal at the greatest distance at which it is visible, the man with three-fifths vision will not see it until he arrives within three-fifths of that greatest distance, the man with half-vision will not see it until he arrives within half that distance. It is obvious that the two last-named men would be liable to lose time in putting on brakes in the case of an impending collision; but it is conceivable, of course, that the time allowed for this purpose by normal vision would always be more than could be required. It is certain, I think, that few signals come into view, on account of curves or other impediments to sight, at the full distance at which they would be visible if no such impediments existed.

When the ophthalmic expert has decided that a given examinee has less than normal vision, he has yet another function to discharge, which is to determine the nature of the cause by which the defect is produced. Roughly speaking, there may be three causes, or at least one of three, in operation. Vision may be rendered imperfect by defective action of the nerve, or by turbidity in parts of the eye, which ought to be transparent, or by faults of shape or curvature. The first two conditions, generally speaking, are only remediable, if at all, by medical or surgical treatment, the third is often remediable by glasses. Here again, therefore, we have to call upon the railway expert to decide whether the occupation of the workman is one in which glasses may safely be employed. It must be remembered that, setting aside ignorant prejudice, the vision obtained by the help of glasses may be just as good as any that is possessed without them; but, on the other hand, there are two possible objections to their use. In the first place, if good vision is required from a worker exposed to the weather, as from a sailor, glasses are wholly inadmissible, because they would frequently be rendered cloudly and useless by rain or spray. They would be inadmissible therefore, I think, on the unprotected footplate of an engine, but quite admissible where the driver was protected by the covering which is now usually supplied to locomotives. Even here, however, the use of spectacles is open to the objection that they are liable to be broken or forgotten, and that a man who is perfectly useful and trustworthy with them, is liable to be rendered useless and dangerous by being accidently deprived of them. On this ground, it again becomes a question for the railway expert, how far he is justified in committing the charge of a train to a driver who is dependent upon an adventitious aid of which he is liable to be deprived. The military authorities will not give commissions in the army to candidates whose unaided vision falls below one-sixth of the normal, and it would perhaps be possible for railways to adopt some similar rule. It is manifest, I think, that the decision of employers on such a question would probably be much influenced by the supply of capable candidates with no infirmities requiring correction. Where men with good vision are plentiful, it is obvious that men with defective vision must be heavily handicapped.

It is worth while to refer for a moment to one form of defective vision, which may admit of complete correction by glasses, but which, if uncorrected, would be especially dangerous for an engine driver. The defect in question is called astigmatism, and consists in the unaided sight being unequally acute for lines in different directions. For example, a man may have natural sight for a vertical line, and yet be shortsighted, even in a high degree, for a horizontal line. Such a man would see perfectly the upright standard of a signal post, even at full normal distance, but he would be unable to see the horizontal arm of the signal until he came much nearer to it. His vision would be at once detected as below the standard by the groups of spots, and might probably be raised to the standard, or nearly so, by glasses; but still, without glasses, he would be a very unfit person to be put in charge of a locomotive.

I may now pass on to the second branch of the subject, which owes its importance to the fact that it is necessary to render both railway and marine signals visible at night, and that, for this purpose, we have no other available means than coloured lights, and no other generally available colours than red and green. Unfortunately, however, nearly 4 per cent. of the male working population of this country are possessed of only imperfect colour vision; and hence are liable to make mistakes in the colours of the lights thus displayed to them. We shall best approach the consideration of their difficulties if we first enquire what colour blindness means, and upon what conditions it appears to depend.

Before such an audience as this, I need not dwell on the fact that what we call light is a sensation produced by the vibration of ether waves entering the eye, or that what we call colour is a sensation produced by the rapidity of the wave movement. We say of sunlight that it is white or colourless, but we easily determine experimentally that it is composed of waves of three definite magnitudes, three different rates of vibration, and, as we say, of three different colours—red, green, and violet. Of these, the red light—which, when sunlight is passed through a prism, falls to the least refracted end of the spectrum—is composed of waves of such magnitude, that it would require 36,918 of them, placed end to end, to cover one inch; while the extreme violet is composed of rays of which 64,631 would be required to cover one inch, the magnitude of the green waves being intermediate. The general velocity of a mixed or white light being, roughly, 190 millions of miles in a second, it follows by a simple calculation that when the eye is looking at pure red, it receives 451 millions of millions of waves in that period of time, and that when it is looking at pure violet, it receives 789 millions of millions in the same period.

Now, the power of seeing light depends upon the communication of its wave movement to the fibres of the optic nerve, and it follows that no light is visible unless its wave movement is thus communicated. In the case of each nerve fibre, there are limits to the rates of vibration which it is able to pick up or to respond to. We are familiar with similar limits in the case of sound. A tuning-fork or a tuned string will only respond to—that is, will only be influenced by—rates of vibration with which it is in unison. If we have a series of tuning-forks, and if we throw one of them into vibration, all those which are in unison with it will vibrate also, while those which are not in unison will remain mute. The average human ear is capable of vibrating in unison with, or, as we say, of hearing, sound waves which cover a range of about eleven octaves, but there are great individual differences at both ends of the scale. Some persons can hear a deeper note than others, some persons can hear a higher note than others. Analagous differences exist between different eyes with regard to light, but in all eyes the range of capacity is much smaller than in the case of the ear, and only covers the equivalent of about a single octave. The actual wave movement of light extends considerably beyond the limits of the visible spectrum. There is an active wave movement here, outside of the extreme red, which is attended by heat, but which is invisible. There is an active wave movement here, to the outside of the violet, which excites some kinds of chemical action, but which is invisible. The retina contains no fibres in unison with, or capable of being affected by, either, and it can easily be demonstrated that the limits of visibility in the spectrum, like the limits of audible sound, vary in different eyes. Some persons see more or less red, some more or less violet, than is usually visible: and in either case, without departure from the commonly recognised conditions of ordinary seeing.

Besides these differences there are others, of a comparatively exceptional kind, which depend upon an incapacity, in the nerve fibres of some eyes, to vibrate in response to waves which, by the great majority, are responded to readily. I have already explained that the red end of the spectrum appears shorter to some persons than to others—that is to say, that the slowest and largest waves fail to call some nerve fibres into corresponding vibration, just as some ears fail to catch the deepest notes which are audible to others. Carry this incapacity to respond to large slow waves a little farther, and we have incapacity to respond, not only to the pure or extreme red, but also to red, the wave movement of which is beginning to be modified by green. The red waves which enter the eye do not excite the nerve fibres to the usual vibration, that is, they do not produce the customary sensation, and the person does not see red, but is completely or incompletely "red-blind." In looking at the spectrum, if it were anywhere of a pure red, he would not see that portion, but would see only the surface of the screen on which the spectrum was thrown, as if the spectrum were not there. But, in ordinary conditions, there is no such thing as pure red, which can only be obtained, for experimental purposes, by very carefully devised contrivances. Even in the spectrum, in which all the shades of orange and yellow are produced by a varying amount of overlapping of the red by the green, the green runs decidedly into portions which most people would call red, and reaches, in some small degree, even to the ordinarily visible extremity. The arrangement is something like that shown in the diagram on the wall, in which red enormously preponderates at one end of the spectrum, green in its central portion, and violet at the other end, but in no case to the absolute exclusion of the other colours. Artificial light, except electric light, differs from sunlight chiefly in being poor in violet, but contains almost the same relative proportions of red and green. If we look at the ordinary red lamp of a train we shall usually see in the centre of the red circle an outline, more or less conspicuous, of the flame which is behind the red glass, and this flame will appear yellowish or orange by comparison with the outer portions of the red circle around it. The reason is that the glass, although we call it red, still transmits a portion of green light, which, blending with the red, produces a yellow or orange tint where it is most pronounced; and a person who was absolutely red-blind, looking at such a lamp would see it by virtue of the green rays which it suffered to pass. It would not be invisible to him, but would present a certain degree of luminosity, and a certain appearance. This appearance would differ from that of a green lamp, in which the preponderance of green rays would be modified, as far as ordinary specimens of glass are concerned, by a certain admixture of violet. Precisely in the same way, a person who was green-blind—and there are such, their optic nerves being incapable of making the ordinary response to the impact of the green waves, which possess an intermediate magnitude and rapidity, would nevertheless, not lose sight of a lamp with a green glass, but would see its luminosity by virtue of the colour other than pure green which it transmitted. There are also persons who are violet-blind, whose nerves will not respond to the small and rapid waves at the violet end of the spectrum, but this defect is very uncommon, and is of little or no practical importance. Red and green lights are those which are used in railway and marine signalling, and the chief practical object of testing colour-vision is to ascertain whether the person tested is normally capable of distinguishing them apart; that is, is capable of distinguishing them with ease and certainty, and without the possibility of error, in all circumstances in which they are fairly visible. We want to know whether the impressions made upon his retina by the two colours are so utterly unlike that there is no possibility of their ever being confounded.

For the attainment of this object, when we come to practical considerations, the worst possible test is one which is employed on many railways, by which the candidate is made to look at the actual signals as they would be presented to him in working, and is called upon to say which is red and which is green, or it may be which means "stop," and which means "go-ahead." Such a test is worse than useless, because, for the reasons already given, the red lamp is not invisible to the red-blind, and the green is not invisible to the green-blind. Each is seen as a light of a small luminosity by virtue of the rays other than red or green which it transmits. Every colour-blind candidate would probably know, to start with, that what people called red, or what they called green, was to his perception a light of feeble luminosity, a faint or dull light instead of a bright one, and he would therefore guess that any dull light was of that particular colour which would naturally appear dull to his consciousness. Even without this help, there would be an even chance of a correct guess the first time, and such a guess would keep him right all through the trial, because the two lights would look different. What is wanted in testing is to eliminate at once the even chance, and the apparent difference of luminosity. Suppose a man is green-blind, and guesses correctly that the first light shown to him, a dim one, is green, he will, of course, feel sure that any brighter one is red. But if he is driving an engine at speed, and he is suddenly confronted by a red signal which, either from a defective lamp or from some atmospheric condition, does not seem to him to be bright, he will take it for green and will rush into the danger which he ought to avoid. All methods of primary testing by actual signals, or by any imitations of them, are vitiated by the circumstance that the colours employed are not sufficiently numerous to eliminate accidental correctness, and that they do not look precisely alike even to the colour-blind, when seen in successive minutes and in similar circumstances of atmosphere and of illumination. The colour-blind person, although not seeing any difference in colour on which he can rely, does see a difference in luminosity, and his weakness depends upon the fact that this difference is not sufficiently characteristic to be at all times trustworthy. For accurate testing it is not enough to see that a candidate, on a given occasion, does not fall into a mistake between two colours, but it is necessary to see that he cannot fall into one. The latter condition will only be fulfilled if his optic nerves possess the natural power of vibrating in response to each of the three primary colours of the spectrum, and, by natural consequence, in response also to their innumerable derivatives.

It was to accomplish this object that Professor Holmgren devised his famous test with coloured wools; and, as the object of this is to ascertain whether a person sees colours correctly, not to ascertain whether he names them correctly, the element of naming is carefully kept out of account. If we are once certain that a person can see the difference between red and green, there cannot be the slightest difficulty in teaching him the right name of each, even supposing that he did not know it before; but the knowledge of the names is absolutely useless as long as there exists any liability to confuse the things. The correct value of Holmgren's test has been very clearly and concisely stated by my friend Mr. Frost, whose words on the subject and whose description of the test I will proceed to quote. He says:—

"The state of colour-vision cannot be measured by making the subject of the test name the colour of substances, for in the first place there may be normal colour sense, and yet from defective education the colour may be wrongly named. In the second place the naming of a colour correctly gives no clue as to the subjective sensation which it excites. A colour-blind person may see reds and greens as different shades of the same colour, but may have learnt that what seem to him to be rather sombre shades of this colour are called red by others, while the brighter tints are called green: he may therefore name the colours correctly, and even believe that he sees the true difference between them, and unless the trial is repeated several times, and with a variety of shades, detection may easily be escaped. In this way a colour-blind guard or pilot may interpret correctly signals to which he has been accustomed; if, however, they are dimmed by rain or mist, or if, from the distance being unknown, he is unable to compare the intensity of a red and green light, he may mistake the one for the other.

(To be continued.)

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

DR. C. A. BUCKLIN continues in the pages of the New York *Jewelers' Circular*, his series of articles on the above-named subject, which so many of our readers have found interesting.

We completed, he says, in our last a description of the various conditions necessary to satisfy in order that both eyes may become properly adjusted. These requirements were much more complicated when both eyes were considered than when simply monocular vision was under consideration. The relations which exist between accommodation and fixation are so intimately connected and so dependent on each other, that a disturbance between these functions is a very frequent cause of weak vision which is quite frequently overlooked. These difficulties are not appreciated by the average optician.

We have given a legitimate consideration to weak ocular muscles, and described the various tests necessary to determine their existence. The satisfactory correction of muscular defects is very difficult and very frequently impossible.

The two classes of cases we have considered under muscles are paralysis which allows one eye to deviate, and insufficiencies which permit of habitual binocular vision by severe exertion of the weakened muscle, which, becoming greatly fatigued, causes muscular asthenopia.

A new set of terms have sprung up in this connection which are quite generally understood, but which have not been recognised by any scientific body. The originator of these terms has very extreme ideas on the subject of ocular muscles, which, after several years of investigation, have completely failed to receive the concurrence of the ophthalmic world. These extreme ideas are advanced by Dr. Stevens, of this city, and although not recognized, have created considerable noise in the world. They are as follows :—

"In this class of muscular faults, binocular vision is maintained by the expenditure of a greater amount of force than is required when the ocular muscles are in a state of perfect equilibrium. The visual lines are habitually held in such relations as to extend from the point of fixation to the yellow spot of the retina, but only by persistent and special effort. The tendency is for the visual lines to wander apart. Such tendencies are grouped under the name 'Heterophoria' (meaning a different tending in the direction of the visual lines). This term is identical with our old term 'muscular insufficiency.'"

When the eyes are directed at *distant* objects situated directly in front of a person the visual lines are practically parallel, and in this position there should be the minimum of strain on the ocular muscles. If this is the case, the ocular muscles are said to be in a state of equilibrium, and in all other adjustments the changes of relations required are made with the least expenditure of effort consistent with the action.

When the muscles are normal in their adjustment this condition orthophoria (right tending).

Heterophoria express a tendency to deviate in any direction. This is divided into—

Esophoria—a tendency of the visual lines inward.

Exophoria—a tendency of the visual lines outward.

Hyperphoria (right or left)—a tendency of the right or left visual line in a direction above his fellow.

Tendencies to deviation in an oblique direction may be expressed by combining these terms, hyper-esophoria, a tending upward and inward, and hyper-exophoria, a tending upward and outward. The designation "right" or "left" must be applied to these terms.

Having gone over these terms, which are entirely new and simply represent the same condition as muscular insufficiency in this, that or the other muscle, we will next consider the method of discovering these faulty tendencies. The person to be examined is seated with the head erect, and the face is turned *squarely* toward the object to be observed.

The object used should be luminous and have a dark background ; a lighted candle at twenty feet, as nearly level with the eye as possible, is used. If any error of refraction exist it should be corrected with appropriate glasses, under these circumstances of normal muscular exertion. This condition is named "*orthophoria.*"

Orthophoria or heterophoria may now be determined by means of prisms in the following manner. First, a prism sufficiently strong to produce diplopia or double vision is placed with its base in before one of the eyes. The two images will be homonymous, that is, the image seen with the right eye will be to the right, and the image seen with the left eye will be to the left. If the two images are seen in exactly the same horizontal plane, no vertical deviation is present. If one of the images rises higher than the other, there is absence of muscular equilibrium in the vertical direction, and this condition is called hyperphoria.

The eye seeing the lower object is the eye which is afflicted with the hyperphoria. The degree of prism base up before one eye or down before the other eye, which brings the two lights to the same level, represents the degree of the hyperphoria. If correcting lenses are worn during the muscular test, great care must be observed not to have them so decentred that they act as prisms. The test for hyperphoria is the first one made.

Next double vision is produced by placing a prism of 7° base up or down. If the two images are seen in the same vertical line after a few minutes, no horizontal deviating tendency is present. If the images are not in the same vertical line, then esophoria or exophoria exists. If the image seen with the right eye is to the right then the tendency is homonymous and esophoria exists. If the image seen with the right eye is seen to the left, the tendencies of the visual lines are to cross and exophoria is present.

If in making this test the abse of the prism is placed with its base down before the right eye, the upper image will be the one seen by the right eye. From this you can judge of the direction the visual line of the right eye tends.

Exophoria exists when the diplopia is crossed.

Esophoria exists when the diplopia is homonymous.

The degree of prism base in or out before one eye which is necessary to bring the two images to a vertical line represents the degree of esophoria or exophoria.

Having determined the deviating tendencies by the methods above described, similar tests may be made at the reading distance. In these tests the method of Graefe is most conveniently employed. On a card a fine straight line is drawn through a dot. Diplopia is produced as before, although stronger prisms are usually required to produce diplopia than were required at the distance. The position of the ball is now observed in testing for heterophoria in the same manner as the candle was used at twenty feet.

As a confirmatory test the author recommends determining the amount of prism each set of muscles can overcome at the distance without producing diplopia, after the manner already described in testing muscles.

Hyperphoria is that condition where with the ability to maintain binocular vision there is a constant tendency for one visual line to wander above its fellow, which tendency is overcome by a constant muscular struggle.

In strabismus there is an actual turning of the axis of one eye above the fellow eye, and it differs, according to Dr. Stevens, from hyperphoria in the absence of ability to maintain single vision. As a fact, however, a large per cent. of persons having vertical strabismus do not have double vision.

Hyperphoria indicates a weakness of one of the vertical muscles ; although the trouble be slight it is much more active in producing weak vision than a much greater amount of defect in any of the other muscles.

Hyperphoria frequently so tires the individual that he will not make any effort with his internal recti to fix at the reading distance. The muscle refuses to act because no relief is obtained from the annoying symptoms when the most energetic efforts are put forth to produce binocular fixation. Hyperphoria is best treated by a tenotomy of the vertical muscle which forces the eye out of place.

Persons having epilepsy and chronic chorea have errors of refraction quite as frequently as other individuals, by which the diseased persons are more annoyed than the healthy individual; consequently the relief gained by the correction of the error of refraction is more keenly appreciated.

The muscular power of this class of patients being greatly reduced they cannot overcome existing errors of refraction so easily as healthy individuals. Neither can they meet the muscular requirements of binocular vision so readily owing to the weakened condition of their muscular systems.

Upon these facts a great theory has been constructed, namely, that epilepsy and chorea are caused by faulty conditions in the adjustment of both eyes, and it has been proposed to treat these severe diseases by means of ocular treatment alone. Our readers will observe that at this point the treatment of ocular defects is branching out into a very extended field. It certainly is a fact that many nervous conditions, chronic headache and dizziness have been entirely relieved by proper glasses.

It had, however, become quite generally noised about that epilepsy was being cured on every hand by men who treated the disease by means of ocular treatment alone. The New York Neurological Society requested the enthusiastic exponent of these ideas to read a paper before the Society expressive of his views.

He did so, and claimed a cure for 50 per cent. of the cases that he had treated by the ocular treatment. This statement so astonished the Neurological Society that they made arrangements to have him, under the observation of a joint commission appointed by the Society, and the person making these wonderful claims treat such cases of epilepsy and chorea as the Society should submit for treatment.

The result of the commission's work after two and a-half years was that as a means of treating epilepsy and chorea they had not been able to convince themselves that the treatment had been of any particular value in a single case submitted by the commission.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*. by Messrs. W. P. Thompson & Boult. Patent Agents, of 323. High Holborn. London. W.C: Newcastle Chambers. Angel Row, Nottingham; 6. Lord Street. Liverpool; and 6, Bank Street, Manchester.

1,002. T. H. Howard. London. for "Improvements in watches and other timepieces." Dated January 20, 1890.

1,131. G. F. Bevan, Swansea. for "An improved watch protector." Dated January 22, 1890.

1,526. G. E. Corniolcy and C. S. Mairet, London. for "An improved measuring instrument, chiefly designed for measuring parts of watches." Dated January 28, 1890.

1,705. H. A. Davis. London. for "An improved watch appointment reminder." Dated January 31. 1890.

1,719. W. Green, near Birmingham, for "Improvement in protectors for watches, trinkets, and other articles of dress." Dated February 1, 1890.

1,842. E. L. Mayer and J. G. Lorrain, London. for "Improvements in or connected with the treatment and recovery of float gold." Dated February 4, 1890.

1,865. W. Tuchmann. London. for "Improvements in illuminated clocks" (complete specification). Dated February 4, 1890.

2,358. J. A. Henston, London. for "Improvements relating to watch case bows or attachments." Dated February 13. 1890.

2,362. F. Redman, London, for "An advertising watch." Dated February 13, 1890.

Recent American Patents.

Button Fastener. G. D. Paul	419,970
Clock Standing Mechanism. C. Braun	420,006
Chain. Wm. C. Edge	419,189
Combination Implement. A. A. Low	419,268
Coffee Pot. R. Mattison	419,965
Cuff Holder. M. D. Strait	419,376
Clock. A. M. Lane...	419,685
Combined Clock and Bell. A. M. Lane	419,686
Electric Penholder. C. W. Reitler	11,053
Electrical Clock. A. R. Jones	419,776
Fountain Pen. W. B. Purvis	419,065
Making Ingots for Plated Ware. J. L. P. Spooner	419,084
Musical Instrument. L. Campiche	418,681
Method of Forming Table Knives. E. Grah...	418,710
Mould for Making Compound Metal Ingots. J. L. P. Spooner...	418,767
Machine for Forming and Bending Metal. J. S. McGiehan ...	419,156
Mechanism for Making Watch Case Centres. F. Ecauhert ...	420,337
Mechanism for Making Watch Case Centres. W. Fitzgerald ...	420,380
Metallurgical Furnace. F. L. Bartlett	420,029
Machine for Rolling Screw Threads. H. K. Jones	419,777
Method of Making Irregular-Shaped Metal Articles. G. F. Simonds	419,292
Machine for Shaping Sheet Metal. G. Naumann	419,344
Method of Making Ingots for Seamless Plated Wire. L. Burdon	419,598
Nippers. T. G. Hall	419,666
Ornamenting and Embossing Machine. E. Geisel...	419,847
Penholder. J. H. Spigener	419,083
Pen and Pencil Holder. U. Bohren	420,033
Pliers. A. A. Low	419,270
Pointing Apparatus for Pencil Holders	419,768
Pliers. A. A. Low	419,272
Rosette for Jewelry. H. E. Goff	419,251
Seamless Plated Ingot. J. L. P. Spooner	419,085
Spiral Screw Button. H. B. Lum	419,206
Stem Winding and Setting Watch. B. Frese	419,654
Securing Dials to Watches. F. F. Ide...	419,525
Watch Case Spring. J. H. Fleming	420,048
Watch Case Spring. B. M. Green	419,517
Watch Bow Fastener. Louis Platnauer	419,552

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*. 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

WORCESTER.

Mason, Harry, 2, Blackwell Street, and residing in lodgings at the "Bull Inn," Swan Street, Kidderminster, watchmaker and jeweller. Trustee Solomon Lyon, 30, Frederick Street, Birmingham, manufacturing jeweller, and another. Unsecured Liabilities, £221 3s. 8d. Estimated Net Assets, £135. Deed of Composition dated February 10, 1890; filed February 11, 1890.

Creditors.		£	s.	d.
Hayden, R. D.	Birmingham	46	0	0
Howell, Joseph	"	38	0	0
Lyon, S.	"	62	0	0
Stainton, J....	"	13	0	0
Mason, Mrs. S.	Kidderminster	30	0	0

LANCASTER.

Kilham. John Henry. 167, Great Jackson Street, Hulme, Manchester, watchmaker and jeweller. Trustee. Walter Davis, 14 and 15, Frederick Street, Birmingham, and another. Unsecured Liabilities, £251 18s. 8d. Estimated Net Assets, £124 10s. Creditors fully secured, £25 10s. Deed of Composition dated January 23, 1890; filed January 29, 1890.

Creditors.		£	s.	d.
Blanckensee, T., and Son, Ltd.	Birmingham	58	0	0
Harris, Henry, and Co.	"	19	0	0
Newsome and Co....	Coventry	12	0	0
Andrew, Ann	Manchester	40	0	0
Rosenthal, Josh., and Son	"	33	0	0
Armstrong, T., and Bros.	"	19	0	0
Allan, Thomas	Withington	12	0	0

MIDDLESEX.

Archard, Alfred Charles (trading as "A. Archard"), 69, South Audley Street. watchmaker and jeweller. Trustee, Richard Warner, 29, New Bridge Street, E.C., chartered accountant. Unsecured Liabilities, £1,497 18s. 8d. Estimated Net Assets, £458 12s. 9d. Creditors fully secured, £15 5s. Deed of Composition dated February 7, 1890; filed February 10. 1890.

Creditors.		£	s.	d.
Archard. Mrs. H.	London	200	0	0
Belaney. Rev. R.	"	25	13	0
Ewart and Son	"	11	3	0
Greenwood, J., and Sons	"	11	0	0
Kingston and Son...	"	13	3	0
Mansell, W. J.	"	14	7	0
Samuel and Son	"	14	10	0
St. Aloysius School Board	"	43	16	10
Vine, T. W....	"	76	14	0
Williamson, H.	"	15	0	0
Whetherel, Lee, and Martin	"	14	0	0
Louis, G.	"	18	0	0
National Provincial Bank of England	"	42	15	7
James, W. H.	"	11	16	2
Duke of Westminster	"	166	13	4
Lyon, S.	Birmingham	240	18	2
Gibney, Mrs.	Nottingham	500	0	0
Gibney, B. J.	"	26	17	6

NORTHAMPTON.

Mortimer, Charles Richard, 54, Bridge Street, Northampton, watchmaker and jeweller. Trustee, Wm. J. Clarke. 12, Guildhall Road, Northampton, accountant. Unsecured Liabilities, £572 5s. 3d. Estimated

Net Assets, £205 4s. 3d. Creditors fully secured, £5 15s. 9d. Deed of Composition dated February 11, 1890; filed February 18, 1 90.

Creditors.		£	s.	d.
Bruce, J. E.	London	10	0	0
Bowman, R. T.	„	27	0	0
Conway and Co.	„	52	0	0
Knox, H. A., and Co.	„	18	0	0
Light, E.	„	16	0	0
R'chard and Co.	„	29	0	0
Schaeffer and Co.	„	34	0	0
Williamson, H.	„	20	0	0
Allday and Sons	Birmingham	24	0	0
Evans and Brown	„	90	0	0
Griffith, W.	„	24	0	0
Fear, A. D., and Co.	„	109	0	0
Hill, Thomas, and Co.	Coventry	10	0	0
Dunmore, E.	Northampton	12	0	0
Hirsch, Pritchard, and Co.	Paris	28	0	0

SUSSEX.

Latimer, William, 10. Robertson Street, Hastings, jeweller. Trustee, Charles Adkins Faraday, Hatton Garden, and another. Unsecured Liabilities, £2,755 17s. 7d. Estimated Net Assets, £2,000. Creditors fully secured, £150. Deed of Composition dated February 3, 1890; filed, February 8, 1890.

Creditors.		£	s.	d.
Faraday and Davey	London	221	7	3
Atkins Bros.	„	61	7	7
Saunders and Shepherd	„	78	2	1
Holland, Aldwinkle, and Slater	„	212	4	1
Hutton and Sons	„	347	14	2
French and Co.	„	204	18	6
Mordan and Co.	„	34	16	6
Scott and Co.	„	82	14	0
Barnard and Sons	„	19	15	0
Smith and Sons	„	24	6	0
Favell, Elliott, and Co.	„	19	6	3
Wellby, —	„	25	4	0
Brown and Sons	„	122	10	0
Deakin and Sons	„	202	16	5
Klenkhardt, —	„	62	8	0
Stauffer, Son, and Co.	„	49	2	6
Gourdel, Vales, and Co.	„	88	6	11
Betzeman, —	„	17	11	6
Richards, —	„	100	0	0
Daglish, Alfred	„	25	0	0
Skinner, —	Birmingham	123	2	10
Sydenham, —	„	137	5	4
Harwood and Plant	„	24	6	0
Wilmot and Sons	„	38	18	10
Beeching's Bank	Hastings	209	9	3
Parsons, —	„	28	0	0
Queen's Taxes	„	17	10	0
Poole, —	„	20	0	0
Thorpe, G. A.	Ore	146	5	0
Simonds, —	Reading	16	2	0
Wingfield, —	Sheffield	43	9	0
Noyes, —	Tunbridge Wells	13	1	0

NORFOLK.

Gorcham, Charles Henry, 91, St. Giles' Street, Norwich, working jeweller. Trustee, C. A. Betts, 35, Livingstone Street, Dereham Road, North Heigham, Norwich, retired tailor. Unsecured Liabilities, £250. Estimated Net Assets, £200. Deed of Composition dated February 19, 1890; filed February 21, 1890.

Creditors.		£	s.	d.
Betts, C. A.	Norwich	110	0	0
Evans and Brown	Birmingham	45	0	0
Larking, Charles	Norwich	12	6	0
Reynolds, W. J.	Birmingham	18	7	0

YORK.

Reid, Lilly Buchanan, 26, Newcomen Street, and Central Hall, Coatham, Redcar, jeweller and fancy goods dealer. Trustee, R. W. Sisson, County Chambers, Newcastle-on-Tyne, C.A., and another, with a Committee of Inspection. Unsecured Liabilities, £1,389 17s. 7d. Estimated Net Assets, £918. Deed of Composition dated February 19, 1890; filed February 21, 1890.

Creditors.		£	s.	d.
Barnasconi, R.	Newcastle-on-Tyne	10	2	0
Brash, —	Leeds	42	2	4
Brooke and Brooke	Birmingham	85	1	0
Boyd, J., and Sons	Manchester	61	0	3
Bunn and Dick	Newcastle-on-Tyne	280	0	0
Crozier and Mitchell	Birmingham	133	4	0
Green and Green	Sheffield	11	13	10
Harrrison, W. W., and Sons	„	46	18	6
Hirsch, Pritchard, and Co.	Paris	14	6	10
Klugherr, —	Offenbach	16	1	6
Lowe and Willetts	Birmingham	14	16	9
Lawrance, Henry	London	18	2	3
Myers, J.	Manchester	35	16	0
Myers, Jacob, and Sons	Birmingham	54	4	8
McLardy, S.	Manchester	22	8	0
Ormiston and Glass	Edinburgh	141	13	0
Wesbez, James	London	64	2	0
Zimmerman, W.	„	11	10	0
Coombs, Mary Mc D.	Liverpool	237	0	0
National Provincial Bank of England	Redcar	120	0	0
Bowie, C.	„	14	0	0
Bradley, Arthur	„	15	0	0

BANKRUPTCY.

Re T. B. Beck.—The debtor is a watchmaker at 19, Harold Street, Hereford, but formerly of Station Street, Lewes, and of Hayward's Heath. —The gross liabilities amounted to £67 7s. 5d., including £65 8s. 5d. to unsecured creditors, and £1 19s. to preferential creditors. The assets were estimated to produce £5 9s. 6d., and when the preferential claims were satisfied there was a deficiency of £61 17s. 11d. The bankrupt attributed his failure to ill-health and want of work. He commenced business as a jobbing watchmaker in the summer of 1884 in Lewes, Sussex, without capital or stock. He carried on business there for a year, and then removed to Hayward's Heath. At Christmas, 1888, he came to Hereford as a journeyman. Having been sworn and examined, he bore out this statement.

Re Robert Whalley, jeweller, Colne.—This debtor was further examined last month at the Burnley Bankruptcy Court, before Mr. Registrar Hartley. In answer to Mr. Sutcliffe, who appeared for the trustee, debtor said he did not know that a piano, which he stated to be on hire, was paid for. Mr. Eastwood, of Albert Road, from whom he got the piano, bought a tea and coffee service from him, and this balanced the account. A large number of questions were put by Mr. Sutcliffe, relating to the accounts. Many persons who were in the list of debtors, denied owing anything to Whalley, who now said there must be an error in the accounts. The Registrar asked what object there was in asking so many questions about his trading. Mr. Sutcliffe said they were put first with a view to the Receiver's report, and next with a view to ulterior proceedings. He wanted to show that he had been selling goods immediately after purchase at less than cost price, and also selling goods which had been sent on approbation. Mr. Emmett cross-examined the debtor at length and the examination was closed.

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller, and Silversmith, 7, *St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller, and Silversmith.*

Dear Sir,—I notice in the Journal, February 1st, a mistake in spelling my name. In the list of Trials at Kew, it is Stockwell instead of Stockall.

Yours truly,

6 & 8, Clerkenwell Road, E.C., J. J. STOCKALL.
February 7, 1890.

Sir,—Can you, or any of your readers, give the address of the inventor of, or dealer in, *Pneumatic Bells?* The information through your Journal for March will be thankfully received.

Kirkby Stephen, R. I.
February 18, 1890.

Dear Sirs,—I enclose one of my business cards which I would deem it a *great* favour if you would post to the agent for . . . . . . , as they do not publish his address and they refuse to do business direct. Undoubtedly the English manufacturer, especially in our lines, is the most conservative and hard-to-be-got-at business man under the sun, and cannot imagine how much he handicaps his own goods. If, for instance, when I buy . . . . . watches now I have to do so through Colonial wholesale houses, who know as much about watches as watches know about them, and who, up to the present day, only import the same lines as they did 15 years ago, and by the time the goods reach the actual seller they have increased in price by *at least* 50 per cent. Every manufacturer who does not care to do business direct with retailers ought to mention, when advertising, some *reliable* agent.

I cannot close without mentioning that your articles headed "Half-hours with our Manufacturers" are *very* interesting and instructive.

Yours, etc.,

Mackay, Queensland, Australia, F. RIECHELMANN
December 30, 1889.

MR. FREDK. B. BOX,

Agent for the Disposal of Watchmakers' and Jewellers' Businesses.

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2. **Watchmaker's and Jeweller's Business,** in most fashionable seaside resort. In same family 100 years. A very well known concern. High class trade and exceptional profits. Well-established connection. Illness sole cause of sale. All at a valuation, about £3,500.
3. **Watchmaker's and Jeweller's Business,** in a good market town, North of England well situated in the Market Place. In same hands 50 years. Returns have been for many years over £3,000 a year. Proprietor retiring. Will let the premises (his own freehold) on advantageous terms. All at a valuation, about £1,700. Purchase arranged with £1,000.
4. **Watchmaker's and Jeweller's Business,** in important town in Devonshire. In same hands 40 years. Proprietor retiring. Average profits over £400 a year. Good sale trade. About £800 required, of which half could remain. Would suit a man without practical experience, as there is very little jobbing trade.
5. **Watchmaker's and Jeweller's Business,** in busy town near Birmingham. Nice shop. Convenient house. Rent £50. Returns (entirely under management) nearly £1,000 Stock and fixtures at a valuation, about £700; part could remain, or reduce the purchase money to £350.
6. **Watchmaker's and Jeweller's Business,** in important seaport. Established over 40 years. Returns over £1,000, at good profits. At a valuation, about £800. Purchase arranged with £500.
7. **Watchmaker's and Jeweller's Business,** in Cheshire. In same hands many years. Returns about £700. Good jobbing trade. Rent £35, all at a valuation, about £400.
8. **Watchmaker's and Jeweller's Business,** (jobbing) in busy neighbourhood in Islington. Very comfortable house. Rent £40. Two rooms let for 11s. a week. Illness sole cause of sale. Established many years. Stock, fixtures, tools, and household furniture, all at a valuation, about £250.
9. **Watchmaker's and Jeweller's Business,** in main road in Brixton. Rent £45. Returns £550 a year. A good connection. About £300.
10. **Watchmaker's and Jeweller's Business,** in good town near Southampton. Rent £35. Convenient house. A good living for a practical man. About £250 required.

Further particulars of any of the above and many others gratis on application.

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CLOCK & INSTRUMENT MAKERS WANTED. Address, stating age, experience, and references to "Electrical," c/o Office of this Journal.—[ADVT.]

WATCHMAKER ASSISTANT. The undersigned is desirous to find a situation in a good English business for his son, who is a thoroughly capable watchmaker, by the 15th of March next.—J. SCHNOOR, Chronometer and Watchmaker, Kiel, Germany.—[ADVT.]

The Watchmaker, Jeweller & Silversmith.

EDITED BY D. GLASGOW, JUN.

Entered at Stationers' Hall.] [*Registered for Transmission Abroad.*

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

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MESSRS. BOSCH, BARTHEL & Co.,

409, George Street, Sydney.

FEBRUARY, which was a dull month, was followed by another equally dull as regards business, but which has been characterised by events of considerable importance to the trade as a whole.

Last month, which, in the former respect, neither came in nor went out in the proverbial manner, was afforded a sort of natural compensation by a series of occurrences of more general interest than those affecting mere trade routine usually have.

First, in happening if not in importance, came the annual meeting of the Birmingham Jewellers' and Silversmiths' Association, a full report of which is published on another page, The main interest in this fixture was, of course, centred in the speech of Mr. Chamberlain and his assurances respecting the intentions of the Government in regard to the removal of the Plate Duties, etc.

In this connection an important paper was presented to Parliament giving details of the practices of foreign Governments in the matters of duties, assaying the precious metals, and hall-marking, with the various standards of quality in use. As some Government action seems imminent in the near future for relieving us from the taxes upon industry at present in force, these particulars should be of the greatest interest to all connected with the manufacture of the precious metals, and we shall reproduce the whole of the parliamentary paper on the subject in the May number of the Journal.

Last, but not least, we have had Mr. Tripplin's exhaustive and carefully-prepared paper (read before the Society of Arts) on "Recent Progress in Watch and Clockmaking." As this is reproduced in the present issue, we need not refer to it further than to remark that the great importance attached to the subject, both by the public and the trade, was fully manifest by the large audience and the interesting discussion which followed. There can be no doubt that the efforts being made by the watch trade in various centres to increase and maintain that pre-eminence which has always been accorded to home productions are at the present time being watched with the greatest attention on all sides, and where practical proofs (such as the highly-satisfactory results of the British exhibit at Paris, cited by Mr. Tripplin) can be produced to show that English manufacturers are fully alive to the exigencies of present requirements and of foreign competition, their publication cannot fail to have a beneficial effect on the trade of the country. With regard to the discussion which followed the paper in question, if, for the sake of argument, it be conceded that the prosperous future of the English watch trade in competition with foreign manufacture lies in the direction of the adoption of more or less automatic machinery the point is not "who were the first to adopt such methods of production" but, rather, "who can, by the use of any such methods and and machinery, produce the best article at the same or a lower price."

GENERAL NOTES

Silver has been discovered at Puhi-Puhi, New Zealand, which assays 5,000 ounces to the ton.

Watch and Clock Makers' Asylum.—An election of one male inmate to this institution, New Southgate, will be held at the annual meeting on Monday, April 21.

We would remind our Conservative readers that the 18th inst. is Primrose Day. Messrs. B. H. Joseph and Co., of Birmingham, keep in stock a very large assortment of Primrose League badges and jewels, of which they will send samples on application.

The Amsterdam Diamond Cutters.—Artisans employed in the Amsterdam diamond-cutting trade are bitterly complaining of the De Beers combination. The foundation of an international society of jewellers for the protection of the trade is spoken of, and probably a diamond bank, with a capital of 25,000,000fl., will be founded.

The testimonial to Sir Polydore de Keyser from the council of the British Section of the Paris Exhibition will be presented to him at the Mansion House on May 6, the anniversary of the opening of the Exhibition. It will consist of a magnificent silver centrepiece and an illuminated address. The presentation will be made by Lord Brassey, the vice-president of the section.

Menu Stand.—The newest freak of fashion, writes the Paris correspondent of a contemporary, is a looking-glass stand for the *menu*. Ladies can see how they look at table. Madame Heine took the other day to her daughter, the Princess of Monaco, with whom she is on a visit at Monaco, four dozen of these mirrors with frames in *repoussé* silver of exquisite workmanship. The fashion has come from Russia.

A Watchmaker Convicted of Felony.—At the Spalding Petty Sessions on March 4, Alfred Henry Kirby, watchmaker and jeweller, Bridge Street, Spalding, was charged with stealing a tin of paint, value 1s., from the shop of Henry Gibson, chemist, a neighbour, on February 20. A fine of £5 and 27s. 6d. costs was imposed. The case created great interest, Kirby being the owner of considerable property in Spalding.

The Munich Jewel Robbery.—Julius Stern, the notorious ringleader of an international gang of burglars, has been arrested at Maria Theresiopel, Hungary. The London, Paris, and Munich police were hunting after Stern, who offered a desperate resistance when apprehended. It was Stern's gang who perpetrated the great jewel robbery at Munich in September last. Stern has made a confession of his guilt in regard to it.

From the Other Side.—Probably the oldest clock in New York city is that in the steeple of St. Paul's Chapel. Its pendulum first commenced to beat in 1798, and with the exception of the necessary stoppages for cleaning, and an occasional freezing of the hands in severe weather, it has been going steadily ever since. This timepiece, that for 92 years has recorded the time day and night, was manufactured by John Thwaites, Clerkenwell, London.

Mr. Alvin Lawrence, of 64, Central Street, Lowell, Mass., U.S.A., writes us as follows concerning his compensation pendulum, a description of which was given in our December issue:—"I am meeting with great success with my pendulum, displacing the finest mercurial ones made in the country; have sold three to the American Waltham Watch Company, one for their office in Montreal, and I am quite busy filling orders. The standard time of this city is now kept by one of my regulators."

Fire in an Aberdeen Jeweller's Shop.—About 8 p.m. on Saturday, March 8, fire was discovered to have broken out in a shop in Correction Wynd, occupied by Mr. James E. Beattie, jeweller. The fire brigade had the outbreak subdued in a very short time. Several drawers containing silver and jewellery were destroyed, and the shop and fittings were considerably damaged. The fire is supposed to have originated under the counter, where some waste paper and sweepings were lying. The loss of stock is covered by insurance.

Casket for Mr. Stanley.—The King of the Belgians has ordered a magnificent gold casket, which he intends to present to Mr. Stanley on his arrival at Brussels. Several of the most expert workmen in Belgium are now engaged on the work, and the lid bears a medallion portrait, not of the donor, but of the illustrious explorer, surrounded with precious stones and elaborate chasing. The casket is to contain the grand cordon of the Order of Leopold, with which Mr. Stanley will be invested at one of the numerous fêtes to be given in his honour.

We regret to announce the death of Mr. Thomas S. Preston, of the well-known firm of watch-movement makers, which took place at Prescot on the 11th ult., after a brief illness, the cause of death being a seizure of the heart, technically called *angina pectoris*. Mr. Preston, who identified himself somewhat prominently with local public affairs, was much respected by all who knew him, and the news of his sudden death caused quite a shock to be felt in the town, where expressions of deep regret were general. He was 52 years of age.

The Morgan Crucible Company, Limited, has just been registered in London by Davidson and Morris, 40 and 42, Queen Victoria Street, E.C., with a capital of £300,000 in 20,000 preference shares of £10, and 1,000 ordinary shares of £100 each. The object of the company is to acquire and take over as a going concern the businesses of crucible manufacturers, potters, and manufacturers of plumbago, belonging to and carried on by the Morgan Crucible Company, in accordance with an agreement, made on February 26, between W. V. Morgan, Walter Morgan, Septimus Morgan, Octavius Morgan, E. V. Morgan, S. A. Peto, and A. R. Harding of the one part, and Ernest M. Morris, on behalf of the company, of the other part.

Edison and the Manufacture of Artificial Sapphires.—Edison is credited, according to a contemporary, with saying that he has used up all the available stock of sapphires in his phonograph, and that he now has to make an imitation stone for himself. But vast quantities of sapphires, or more properly blue corundum, are in the European market, and the supply, mainly from India, is capable of indefinite expansion. If Edison can make a good enough sapphire for his phonographic use, it is evident that he doesn't need much of a sapphire. One who can make sapphires can make rubies, and that has been tried again and again. Rubies and sapphires are both corundum, the difference being merely in the colour. The great source of sapphires has for ages been the mountains of India.

Charge of Theft.—John Grant, watchmaker, of Heathfield, Sussex, was charged last month with stealing a watch, value £2 5s., the property of Mr. Phillips, watch dealer, of Redhill. It appears that the watch was entrusted to the defendant to repair, and he sold the same. Richard Beck, landlord of the Barley Mow, Punnett's Town, Heathfield, stated defendant came to him on December 6, and said he was going away and wished to pay what he owed. He was then told the amount was 13s. 10d. Defendant then offered a silver watch for 17s. Witness took it and gave him 3s. to settle the debt. Witness had since sold the watch to Mr. French, chicken fatter, of Heathfield. He should think the watch, when new, would be worth 21s. Defendant pleaded not guilty, and was committed to take his trial at the assizes. Bail to the amount of £10 self, and surety £10 was accepted.

The Tealing Necklace and Urn.—Mr. G. B. Paul, solicitor, Dundee, agent for the late Mr. John Sturrock's trustees, has forwarded a petition to the Queen's Remembrancer, detailing the circumstances of the finding of an urn and necklace by Mr. Sturrock in a stone coffin at Tealing ten years ago. The petition sets forth that these articles are quite different from what is usually styled treasure trove, and that the preservation of the urn and necklace was due to Mr. Sturrock's experience and inventive genius. Considering his services to his country in the Crimea, where his health was shattered, his services as an antiquary, and the fact that he gave publicity to the finding of the urn and necklace, and showed them in the Antiquarian Museum, Edinburgh, for two years, the Crown is asked to waive all claim to the articles; or alternatively, if the Crown determines to retain them, a sum of £150 is craved, that being the sum which Mr. Sturrock had been offered for them.

Fire in Argyle Street, Glasgow.—Last month, a fire broke out in the premises of Messrs. R. and W. Sorley, goldsmiths and jewellers, at the corner of Argyle and Buchanan Streets, Glasgow. The ground floor and basement are tenanted by the firm named, while the greater portion of the extensive building in which the shop is situated is occupied by Messrs. Stewart and M'Donald, warehousemen and manufacturers. The premises of Messrs. Sorley are lighted by electricity, and it is supposed that the fire was originated through a defective wire melting a gas-pipe, and causing the gas and woodwork to become ignited. The alarm was communicated to the St. Enoch's fire station and the central brigade. Arriving on the scene early, the firemen had no difficulty in subduing the flames. John M'Gregor, fireman, met with an accident which illustrates the danger of the electric lighting system. Having stepped on to a metallic grating on the pavement he received a severe shock and fell. It is believed that the electric wire had in some way come in contract with the grating. The fireman is recovering from the effects of the shock. The damage done by fire and water is roughly estimated at £60.

Tuticorin Pearl Fishery.—Favourable reports are to hand from Madras of the results of this season's fishing. The price realised for the oysters is rising, and as much as 26s. per thousand have, in some cases, been obtained. Merchants are rather slow in coming forward; but the divers themselves, who are mostly Arabs, are keen purchasers, and have in many cases done well. Some very valuable pearls have been found, and hopes are entertained that next year's fishing will also yield favourable results. About 6,000 to 7,000 oysters have been taken daily in each boat, and on one occasion as many as 70,000 were brought in on one day by all the vessels employed. The bank now being fished has had a long rest, as it was last operated upon in 1821, and much larger quantities might be obtained if more divers were available. The men from Ceylon who promised to put in an appearance have failed to keep their word, and it is alleged that they do not like the Madras side as well as their own, as the water at Tuticorin is twice as deep as on the Ceylon side. The authorities of the island have also done their best to retain their own men; and it seems a pity that both fisheries should be conducted simultaneously, as a little arrangement might enable both to be more profitably worked.

The Pontianak Diamond Syndicate, Limited.—Registered by Davidson and Morris, 40 and 42, Queen Victoria Street, E.C., with a capital of £20,000 in £500 shares. Object, to purchase or otherwise acquire any grants, concessions, leases, claims, or authorities of or over or in respect of mineral properties, mines, mining rights, lands, water, and other rights in Borneo, and either absolutely or conditionally, and either solely or jointly with others, and for such purposes to enter into an agreement made between Alfred Thompson and the company, and to acquire and work the concession, mining, and other rights which are intended to be sold to the company under such agreement. The first subscribers, each holding one share, are:—J. A. H. Drought, 2, Montagu Place, W.; D. Brown, 46, Lancaster Gate, W.; A. Thompson, Connaught Mansions, S.W.; J. B. Fosberry, Horbury House, Eastbourne; W. C. Punchard, 25, Jermyn Street, S.W.; J. Fraser, 31, Lombard Street; J. Scott, 1, Whittington Avenue. There shall not be less than three nor more than five directors. The first are General G. de la Poer Beresford, of Eament, Cheltenham; J. Fraser, of Singapore; D. Brown, and A. Thompson. Remuneration to be determined in general meeting.

To Restore the Colour of Gold.—The simplest and easiest method is to expose all parts of the article to a uniform heat, allow the article to cool, then boil it until bright, in a pickle made with about ½oz. of sulphuric acid to 1oz. of rain water. Another way is to first pickle, then colour. Anneal and boil in a pickle made of nitric acid and water, then again anneal black, and dip in colouring mixture made as follows:—Put into the colouring pot, or a No. 10 black-lead crucible 9ozs. 12dwts. of saltpetre and 4ozs. 15dwts. of table salt. Heat it up without water, then add hot water enough to make a thick paste; let it boil, add 6½ozs. of muriatic acid and stir it up well. In using, keep up a quick and lively fire, and the mixture should boil up till it fills the crucible, which should have been previously well annealed to avoid breaking. The mixture removes more or less of the gold, and the operation should therefore be performed as quickly as possible. With good gold, one and one-half to two minutes will be long enough to expose it in the mixture. The article should be constantly stirred about, taking care not to let any of the service get out of colour, as the vapours will affect the work. Thenr inse it in a pickle, dip in hot water, and dry thoroughly in hot sawdust. This colour may be used with gold ranging between 12 and 20 carats fine, but the finest colouring can be got with about 15 carat gold. If not thoroughly dried, the work is liable to become spotted. Much practice is needed to be successful. Colouring is almost an art in itself, and there are many different ways employed by different jewellers, and the new beginner must not expect to be successful at once.

The Diamond Market and Metals.

The Diamond Market.—The condition of this market is so similar in almost every respect to that recorded in our last No., and, for the matter of that, in several previous Nos., that it would be almost sufficient to refer those interested in *les pierres precieuses* to our former pars. under the above heading.

According to *De Diamant*, (which, by-the-way, thinks it necessary, presumably in order to protect itself from trans-Atlantic "cribbers," to give its lucubrations, heretofore rendered into what by courtesy must be called "English," in what by the same stretch may be considered "French"), would-be buyers will not give the high prices demanded, while would-be sellers won't sell at a loss, consequently little is done in the way of business transactions, which results in little work for the polishers and cutters.

In *Paris* a few American buyers are making cautious purchases.

The *London* business may be summarised as—few buyers, a scarcity of stones, and little or no business. The usual steamers arrived during the month, but little prospect of a change in the present conditions of affairs is to be recorded.

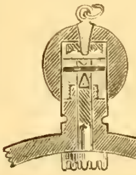
METALS.—The latest official quotations are as follow :—*Silver.*—Bars 43$\frac{3}{4}$d. per oz. *Copper.*—Lowest, £47 5s. ; highest, £47 15s. Chili bars, G.O.B.'s and G.M.B.'s, cash, £47 15s. to £48 2s. 6d.; three months, £48 2s. 6d. to £48 10s. *Tin.*—Fine foreign, cash Straits, £90 15s. to £91 5s. ; Australian, £91 2s. 6d. to £91 12s. 6d. ; three months, Straits, £91 10s. to £92. *Lead* is dull. Spanish soft, £12 7s. 6d. to £12 10s. English, ordinary brands, £12 10s. *Spelter* is steady. Ordinary brands, £21 15s. ; special ditto, £22. English soft V & S, £22 10s. Swansea. *Quicksilver* is £9 5s. from first and £9 4s. from second hands. Brand and delivery. *London Pig Iron.*—Scotch warrants, 50s. 6d. cash, 50s. 9d. one month ; Middlesborough warrants, 50s. 2d. cash, 50s. 5d. one month. Hematite warrants, 63s. cash, 63s. 4d. one month.

TRADE NOTES

BRADFORD.—PRESENT FOR SIR CHAS. HALLE.—Last month the subscribers to the Bradford Subscription Concerts memorised Sir Charles Halle's 25th year in connection with them by presenting him with an address in a handsome silver casket. The casket containing the address is of solid silver, and has been produced by Messrs. Fattorini and Sons, of Bradford. It is fourteen inches in length and nine in height, and the lid is in the form of a pedestal of a design based on a formation of St. George's Hall. Surmounting it is a figure of Apollo, standing lyre in hand and leading the choir of the Muses. The sides of the lid are richly ornamented with symbolical representations of the recipient's art, and around its base there runs the following inscription : "Presented to Sir Charles Halle by the subscribers of the Bradford Subscription Concerts, March 7th, 1890." On the front of the casket are the Bradford coat of arms and crest and the arms and crest of Sir Charles enamelled. The two shields are emblazoned in proper heraldic colours, and together with the enamelled panels by which they are flanked greatly enhance the appearance of the gift. One of the side panels represents an exterior view of St. George's Hall, with which so many of his visits to Bradford are connected, and the other, which has been prepared by Mr. A. North, shows the appearance of the orchestra of the hall on the last occasion when Sir Charles was present, namely, at the Subscription Concert on February 21, the scene depicted being the singing of a quartette by Miss Anna Williams, Miss Damian, Mr. Edward Lloyd, and Mr. Watkin Mills, during the performance of Beethoven's Mass in D. At one end of the casket is the figure of St. Cecilia playing the organ, executed in *repoussé* work, the design being copied from an ancient mosaic, and at the end is a figure of Orpheus charming the beasts of the forest and the birds of the air with his lute. Panels on the reverse represent musical instruments. The casket, which is a highly creditable example of the silversmith's art, has been executed at the cost of about £70, and will doubtless be highly treasured by Sir Charles as a fitting expression of the esteem in which he is held by the musical public of Bradford. The casket is enclosed in a satin-lined case of pollard oak.

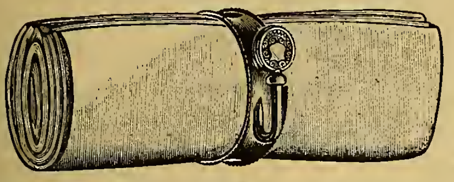
MAYORAL CHAIN FOR TAMWORTH.—At the opening of Municipal Buildings at Tamworth on 8th October last, regret was publicly expressed that the borough, although of so great antiquity, did not possess a chain of office. Mr. P. Albert Muntz, the first M.P. for the Tamworth Division of Warwickshire, generously undertook to repair the deficiency, and the result is a very elaborate and beautiful chain and badge, which is now completed by Messrs. T. and J. Bragg, of Birmingham. The whole is in 18-carat quality gold, every link of chain being hall-marked, and the design has been arranged with a close relation to the historical associations of the place. The badge is circular in form, having in centre an enamelled representation of the cognisance of the borough, a richly-engraved fleur-de-lis, upon a field ermine, with a legend partly encircling it as in the town seal. Surrounding this is a wreath of entwined oak and laurel sub-divided by blue enamelled bosses or cabochons, each of which has a gold letter so that the name Tamworth is given in series. Encircling the whole is a carved gold border of fleur-de-lis, repeating the motive of the borough cognisance, and affording a very light and beautiful effect. The chain commences, as was desired, with a centre link, bold in form, bearing the arms, crest, and motto of the donor, given in correct colours in enamel painting, and beside these are fac-similes in miniature of the two ancient maces of the town. The chain consists of a number of large links of renaissance style, interspaced with circular ones, and while one large link is left alternately to receive a mayoral record if desired, other large links round the chain are surmounted by royal crowns, and are occupied with enamel shields representing the historical associations of the borough. As Tamworth is in two counties, Warwick and Stafford, the arms of these counties are severally given. Civic privileges having been first granted by Canute, the Danish helmet with raven's wings is shown upon one shield. Henry I., who first gave a special charter, is represented by the two English lions upon a field gules ; and Elizabeth, who gave what is now the working charter, is indicated on another shield by the arms of her reign, the fleur-de-lis of France, quartered with the three lions of England. The shield of the bishop of the diocese completes the historical allusions. The whole is carried out in the best style and an appropriate inscription records the gift to the borough.

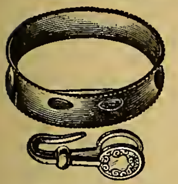
THE annexed cut illustrates the invention of Mr. Christian Lange, of 23, Great Portland Street, for doing away with the bow ring in keyless watches. The bow ring, it is generally admitted, would be far better dispensed with, could any other mode of attachment of the watch to the chain, equally secure and convenient, be devised. Of the numerous contrivances for the purpose, Mr. Lange's is the best we have yet seen. It is strong and neat ; the watch is as easily, or easier, wound by the button in the usual way, and complete security is ensured to the wearer of the watch with this system from the ordinary method of the pickpocket, viz : that of twisting off the bow with the thumb and finger.



MR. S. NAYLOR, of 12, Corporation Street, Halifax, is the patentee of a new portable electric alarm clock, which is guaranteed to awaken the heaviest sleeper. It can be rung at any time, and will continue ringing, unless stopped, for about two hours. The clock and its adjuncts are simple in construction and neat in appearance, while the price should bring it into favour with both the trade and public.

As will be seen from their altered advertisement on another page, Messrs. Flavell and Co. are another of the many watchmaking firms who have gone into the cycling manufacture. Relying, probably, on the fact that firms having an established reputation can and do obtain a profit far away beyond what, in the ordinary sense of the word, can be considered "reasonable," they have (without any "cutting" in prices) established a factory for the manufacture of "safeties," into which they guarantee nothing but the best materials are used, and which they are now offering at prices that should assure an immediate demand. As might be expected, from their former associations with the trade, they offer special facilities and commissions to watchmakers for dealing in these cycles, and we do not see why the trade in many centres should not avail themselves largely of the opportunity thus afforded of adding a new and lucrative branch to their business.





The annexed cuts illustrate a combination serviette ring and hook, introduced to the market and patented by Messrs. G. E. Walton and Co., Hylton Street, Birmingham. When not in use as a suspender, the hook is inserted in one of the holes in the ring, where it is securely held in a tube which prevents the point of the hook from catching in the napkin when it is pushed through the ring. Although it can hardly be said to be yet quite public property, the manufacturers have already experienced, we understand, a large demand for the novelty. The illustrations render further description unnecessary. It is manufactured in untarnishable white metal, wood, Hall-marked silver, etc., and samples and prices can be obtained from the firm on application.

Midland Jottings.

⁂ *Correspondence for "Midland Jottings" should be addressed to the Editor at the Birmingham Office, 22, Hylton Street, Birmingham, where it should arrive not later than the 20th of each month.*

The Birmingham jewellers' and silversmiths' grumblings, to which we took exception in some previous "Jottings," have been to some extent justified by the dullness of the past month. With the exception of some of the special productions of the "hardware city," in which the demand seldom or never fails to keep pace with the supply, the trade of March has been, to say the least, generally disappointing, and had it not been for various enlivening incidents that have gone some way to inspire manufacturers with a certain amount of confidence, the present "Jottings" might almost as well have been deferred to another issue.

Mr. Joseph Masters, 17, Hertford Place, Coventry, has removed to more commodious premises at 65, St. John's Street.

The chief event of the month was, of course, the important meeting of the association referred to and reported at length elsewhere. At this meeting, Mr. Chamberlain's speech was naturally looked forward to expectantly by all connected with the association (as indeed it was by those outside its pale), and the speech, when delivered, in some of its details fully justified the expectations of his listeners. Mr. Chamberlain has indeed so identified himself with his constituents, among whom the jewellers are by no means the least important body, that anything he may say on trade matters is always listened to with the profoundest interest and respect, and that part of his oration in which he alluded to the repeal of the plate duties and the implied engagement of the Government to that end, was received with marked satisfaction.

As to his archæological disquisition, that was taken as the necessary "padding" to an after-dinner speech. Whether the *naissance* of the Birmingham jewellery industry dates from the time of the good King Charles II., or from that of the Huguenots, is a small matter to modern jewellers. What they are most concerned about is to improve their position both in home and foreign markets, as well as in relation to foreign competition. The technical education question, especially as regards design in jewellery, was also a fine theme and appropriate for the chief speaker to dilate upon, and the members of the association, which is, as is well known, doing good work in this direction, received with every appearance of satisfaction his encomiums on their efforts.

Like Mr. Bedford, of the American Waltham Watch Company (who, in the discussion following the reading of Mr. Tripplin's paper at the Society of Arts, announced the fact), we are free-traders; still (although politics are strictly "barred" in this journal), "on this occasion only," we must be allowed to differ from Mr. Chamberlain on the subject of imported foreign labour. Skilled artisans, like the Huguenots may have been, are all very well, but we draw the line at the pauper importations, such as those who are swamping out the East End of London, who first cut down the prices of almost everything they go in for, knock out the poor English devils they compete against, and then——strike.

Talking of strikes, Birmingham has had a perfect plethora of them during the last few weeks—first the bedstead hands; then the brass people; and, lastly, we are threatened with a pen girls' strike. Luckily, the jewellers' workpeople are either better disposed to their employers or are "not built that way."

The Birmingham police are "on the track" of what is believed to be an organised gang of burglars, who have lately perpetrated some shop-cracking of a remarkably daring character. Their last victim is Mr. Brocklebank, of Union Passage, from whom they succeeded in getting ninety gold and silver watches, and a variety of other jewellery. As the Birmingham police are credited with possessing a good deal more acumen than their London brethren, it is to be hoped they will speedily succeed in detecting the delinquents.

Among spoon and fork manufacturers, a good trade is being done in plated and white metal goods of this description with South America and Australia, and consequently German silver manufacturers and refiners are reported busy.

The report to the creditors of E. J. Adams, optician, whose failure was recently gazetted, affords instructive reading as to the methods of some modern business possibilities. The report shows that the debtor commenced business in 1863 at 76, Spencer Street, Birmingham, as a manufacturing jeweller. He had no capital, but borrowed £50 from a loan society. In 1870 he opened a retail shop in New Street, Birmingham, and about 1878 additional premises in Bull Street, Birmingham. He continued the wholesale business at Spencer Street until 1881, when he removed to 34, St. Paul's Square, Birmingham. In 1888 he opened a further retail shop in the Great Western Arcade, Birmingham. The undertaking was unsuccessful, as a loss was sustained by each week's trading. For some time prior to 1886 the bankrupt had been in the habit of assisting a Mr. S. Cranmore, of Vyse Street, Birmingham, by endorsing his customers' bills. Cranmore absconded in September, 1886, and the bankrupt had to pay £530. This embarrassed him, but he was enabled to continue trading. No balance-sheet was prepared at the time, but he is of opinion that, notwithstanding this loss, he was solvent. The bankrupt became aware in August, 1887, of his insolvent position, which he attributes to bad trade, heavy trade expenses, and losses through Cranmore. On August 24, 1888, he executed a deed of assignment, and Mr. E. M. Sharp was appointed trustee. The statement of affairs submitted to the creditors showed liabilities £1,510 4s. 2d., assets £451 11s. 10d. A dividend of 1s. 7d. per pound was paid to the assenting creditors. Since August, 1888, the bankrupt has not traded. The present proceedings were instituted in consequence of several creditors declining to assent to the deed of assignment. There is a deficiency of £213 on the present account.

The ordinary general meeting of Muntz's Metal Company was held on March 5. In moving the adoption of the report the chairman (Mr. George Heaton) said, in respect to the resolution passed at the last meeting of the shareholders upon the subject of the re-adjustment of the company's capital, it was impossible that it could be carried out at present. Its adoption would involve a dissolution of the present company, and the formation of a new company under the same style and title. The main principles of the directors' proposals were that all the shares, of whatever sort, should be turned into shares of £5 each fully paid. With reference to the £10 shares, they would be divided into two shares of £5 each, and as regards shares upon which £5 10s. had been paid, it was proposed to issue, in respect of each share, a share of £5 value, and to deal with the 10s. by giving a certificate to the holder of each share for the 10s., ten of which certificates would entitle him to a full share of £5, or he might receive the amount if he chose to do so in cash. It was further proposed that the capital should be divided in the future in the proportion of two-fifths preference capital and three-fifths ordinary capital, the preference capital having preferential rights as to capital as well as to dividend, such rights being accumulative. In reply to Sir F. Young, Mr. Heaton said that the directors could not make the proposed change without the shareholders first resolving upon it, and in answer to Mr. J. H. Pearson, he remarked that the division of the capital into preference and ordinary capital would not affect the question of the income to be gained by the company. It would only affect the division. There was nothing limiting the directors to pay 10 per cent. A dividend of 7½ per cent. and a bonus of 5 per cent. were approved.

It is satisfactory to note that with the continued increase in the prosperity of the Coventry watch trade, the manufacturers of this important centre of the trade are maintaining their reputation for the quality of their products at the same time. We have before had to chronicle the excellent results achieved at the Kew trials by Coventry watches, and now come Messrs. Newsome and Co. with another record, a watch, No. 102,816, manufactured by them, having just obtained the remarkable number of 36·4 marks out of a possible 40 for positional adjustment. Absolute perfection does not seem so far off, after all.

Mr. A. Scott, manufacturing jeweller, has removed from 39, Frederick Street, Birmingham, to more commodious premises at 62, Summer Hill Road, Birmingham.

SHEFFIELD
NOTES

From Our Correspondent.

There is a great deal of talk in the town just now about technical education. Although classes have been in existence for some time the technical educators do not seem to have grappled the initial problem as to what the term means. A notion, which once seemed to prevail, that technical education meant the teaching of trades to boys at school has been dispelled, but nothing more tangible has taken its place. Lads at the Central School are getting what is supposed to be technical education, but the only result hitherto has been a consuming desire on the part of their parents to place them as electrical engineers and so forth. After paying a premium and serving their apprenticeship these unfortunate boys will probably think themselves exceedingly lucky to get a situation at 30s. per week. This is not, of course, the result aimed at, but, judging from appearances, it is none the less likely to be the outcome of the hazy notions which prevail about technical education.

The original idea in the minds of the advocates of technical education was the thorough grounding of the workman in the principles which underlie his daily work. There are doubtless excellent workmen who do their work by rule of thumb. It would, nevertheless, be an advantage if the workman, say, in the plating shop of an electro-plate factory, knew sufficient of chemistry to understand his plating solution, and enough of electricity to regulate the current passing through his vat. We in Sheffield cannot afford to ignore these things. The competition of foreign rivals is becoming too keen too permit of us neglecting any advantage which may accrue from educating our workmen in a more thorough knowledge of their respective crafts.

Another large electro-plate concern will shortly move from one part of the town to another. Mr. R. Richardson, whose works are a prominent feature in Norfolk Street, close to those of Messrs. Mappin and Webb, is about to move into the works formerly occupied by Messrs. John Harrison and Co., Limited, in Scotland Street. The latter manufactory has not the dignified exterior of the works in Norfolk Street, but the exigencies of the leasehold system under which so much of the land in Sheffield is held leaves manufacturers very little choice in the selection of sites.

A week or two ago readers of the morning papers noted with interest a paragraph stating that a certain Sheffield firm of world-wide reputation was about to increase its capital. It was not clear to anybody why a resolution like this should be proclaimed on the housetops. Shortly afterwards it became known that the cashier of the firm in question, an official who had been in the service of the company very many years, had got his *congè*. As his integrity as a cashier was not called in question the public, after its wont, put two and two together and came to the conclusion that he had been indiscreetly telling tales out of school. Be that as it may, the company has since declared an interim dividend, but no other mention has been publicly made about any contemplated increase of capital.

There are people who don't seem to have any room in their heads for more than one idea at a time. Although they share this peculiarity with a humble domestic quadruped they have, doubtless, their use in the economy of things. They have been the means in the past of assisting in the solution of questions which the vast majority of mankind did not feel called upon to bother their heads about. Such are the people who are continually occupying valuable space in the local press advocating the abolition of the plate duties and compulsory hall-marking. If any section of the public might be expected to take a special interest in this question, it would be the manufacturers of silver and electro-plated goods. Singularly enough, however, these are the very people who have least to say in the matter. As nobody has ever accused the Sheffield silversmiths of lack of public spirit, the explanation of this state of things must be found in its intrinsic unimportance as a trade question.

Mr. H. Wilkins, who has just resigned the post of manager of the hollow-ware department at the works of Messrs. John Round and Son, Tudor Works, has been entertained to supper at the Derby Hotel, Lansdowne Road, by the workmen of that department. Mr. Hartly, one of the oldest workmen, in the name of the committee presented Mr. and Mrs. Wilkins with their portraits and also a handsome inkstand and album, these latter being specially contributed by the burnishers. The meeting was prolonged with music and song and was enjoyed as only silversmiths can enjoy such gatherings.

A long-standing problem which it has taxed the wit of our corporation to solve is the widening of High Street. What is the use of luxuriously fitted-up jewellers' shops, if one cannot look into the windows without obstructing the thoroughfare? Yet this has long been our condition, and the evil is only intensified by the lapse of years. The High Street part of the Improvement Bill had to be dropped owing to the opposition of the property owners, who threatened to wreck the whole scheme. An attempt was subsequently made to come to terms with them privately, but the prices asked were exorbitant and the matter was again dropped. Now the subject is cropping up again, as the evil is getting quite unbearable, but the property owners seem as obstructive as ever. An alternative scheme is therefore seriously entertained (which, if carried out, would leave High Street untouched) and run a new street through the old property at the back. This, of course, would ruin the old thoroughfare, but that is a small matter from the point of view of the general public.

As has been more than once indicated in these Notes the question of false marking is of vital importance to Sheffield. The Act passed two years ago accomplished a good deal, but experience has shown that it is not perfect. The proverbial coach-and-six can be driven through it at a very important point. The select committee now inquiring into its working has elicited the fact that foreign-made goods stamped with the name of Sheffield are imported into London, where they are trans-shipped and re-exported without the officials of the Board of Trade having any power under the Act to prevent it. It is a great thing to be able to prevent the sale of such goods in the United Kingdom, and much good has already resulted from it; but a large proportion of the trade of the town is foreign trade, and so far as this is concerned the Act has accomplished comparatively little. This is especially the case with regard to India, where Sheffield manufacturers have suffered more than anywhere else from the tricks of their continental rivals. It is confidently expected that the present session of Parliament will not come to an end before it has so amended the Act as to meet the foregoing class of cases, and the different public bodies of the town are exerting themselves to that effect.

THE coal crisis has come to an end, and we have had no prolonged strike. That is so much to be thankful for, but the outlook is anything but a hopeful one for all that. The large steel works who are paying their 25 per cent. dividends can very well afford to pay a good deal more for their coal than they are now doing, but they are the only people who can. Sooner or later the enhanced price of fuel will begin to tell all round, and the general trade of the country suffer in proportion. When this does take place, I am not sure that the colliers will have much to congratulate themselves upon. There is such a thing in nature as the irony of retribution. In the meantime trade is good, and it is pleasanter sometimes not to look too far ahead.

Recent Progress in British Watch and Clockmaking.

By Julien Tripplin.

Read before the Society of Arts, March 5.

AT the request of the council of the Society of Arts, I have this evening to read to you a paper on the progress made in England in watch and clockmaking during the last ten years. The council was probably induced to confer this distinction upon me knowing that part of my life has been passed in the manufacturing districts of Switzerland, France, and England, and also on account of my having had the honour to serve as the English juror at the late Paris Exhibition. The conclusions I drew from the examination of the many exhibits there may enable me to bring a few facts before you in connection with the development of English watch and clockmaking, as compared with that of Continental manufacturers.

The one fact which that great exhibition has made patent, not only to me, but to the eyes of all competitors, is that the English watch and clockmaking trade has awakened from a long lethargy and has entered on a veritable renaissance. The time at my disposal, according to the rules of this society—one hour—is short to properly treat so extensive a subject, as I shall have occasion to revert in the course of my remarks to our past condition.

At Paris, there were altogether 500 clock and watchmaking exhibits, coming from Austria, the Argentine Republic, Belgium, England, France with five centres (Besançon, Haute Savoie, Beaucourt District, St. Nicholas d'Alièremont, and Paris), Italy, Japan, Roumania, Switzerland (with its 147 exhibitors), and the United States of America. Of these 150 were watch and 37 clock manufacturers, and these are the only sections that need occupy me at present, as they will be the subject of my paper.

As most people are now well aware, considerable changes have recently taken place in the way of producing time-keeping mechanisms. A rough distinction is made between the old and new methods by the terms "hand-made" and "machine-made," and for the purposes of this paper I have adopted these terms, pointing out that when examined closely no line of demarcation can be found; these being purely a question of degree, the one method slides gradually into the other by insensible steps, and, after all, the material point for the consumer is not how a thing is made, but its price and quality.

Taking the class of watch manufacturers, the somewhat large number of 150 exhibitors may at once be separated into two groups, viz.:—

A.—Manufacturers by the new mechanical processes, that is to say, those who, by means of steam or hydraulic power, new appliances, improved organisations, and larger output, make the whole or part of the watch on the interchangeable system.

B.—Those makers who follow the old mode of watchmaking, still almost exclusively in use in Clerkenwell, partly at Coventry, and also at Besançon and parts of Switzerland, wherein the rough movement is produced in places which are far distant from those localities in which the finishing operations of jewelling, dial-making, 'scaping, chasing, finishing, timing, and adjusting are done under a system of sub-letting to small makers who work at their own homes.

Of the former there were 25, and of the latter 125 exhibitors. Dividing these again into nationalities we found that in Group A (25) England had 1, France 6, Switzerland 16, America 2; while in Group B (125) England again had 1, France 49, and Switzerland 75. This classification is, of course, not sharply defined, as in some cases it became difficult to discriminate, but it facilitates the task of examining and comparing.

The importance of the question of watchmaking by mechanical processes, suggesting as it does a large, complicated, and complete manufacture, deserved from the members of the jury some analysis. A small amount of investigation made it clear that under this heading were grouped a number of manufacturers who differed widely in the extent to which they carried out the principle; indeed, five fairly-well defined divisions were seen to exist. These may be stated as follow:—

A.—The watchmakers using automatic appliances more or less in the making of plates and barrels, and of various parts of the watch, but who obtain wheels and pinions from outside their own organisations.

B.—Those firms making the movement complete, including wheels and pinions, but not the parts of the escapement.

C.—Those who couple the finishing process with the operations of Group B, but who yet obtain the parts of the escapement outside.

D.—Firms who add casemaking (sometimes only in metal and silver, sometimes both in silver and gold) to the operations of Group C; still, however, obtaining the parts of the escapement from elsewhere.

E.—Those firms whose organisation embraces the making and finishing of the whole of the parts of the watch and the case, except the specialised parts of the main-spring, balance-spring, hands, and perhaps jewel holes.

Accepting these divisions as in the main indicative of various degrees of watchmaking by machinery, although it is true they interlace in great complexity, and applying this analysis to last year's exhibition, it was noticed that Switzerland, so strong in collectivity, was comparatively weak in category of type E.

Looking at the testimony of the exhibits themselves, we found none that realised the conditions of Group E, except the English firm of Rotherham and Sons (and perhaps that of Messrs. Japy Frères and the well-known Waterbury Company of America; but these two firms only deal with metal-cased watches of less than ten shillings in cost, and can scarcely be considered when speaking of watches of precision), and this firm thus at once attracted attention, even among so large a number of exhibitors taking part in the competition.

It is difficult to assign a reason why the Swiss have not yet carried their revision of operations far enough to cover the ground that the American and English companies consider the ultimate necessary extension of the modern mode of manufacture. Probably the causes are manifold; it may be large command of skilled labour and an extensive subdivision in their older method having created certain vested interests in the community and making it more difficult to change; or it may be the large capital required and the absence of joint stock enterprise in Switzerland. Again, the cheapness of their productions, made under their old methods, would naturally at first render them freer from competition, and so necessity, which on close investigation is always seen to be the compelling agent, was not early felt by them. Be this as it may, there can be little doubt to-day of the enormous gain of carrying the combinations to the extent of Group E: it is, in fact, the only rational course which meets the requirements of this present time.

Before entering into a more detailed consideration of this Group E, which forms the main body of my remarks, allow me to say a few words on the British section as it was arranged in Paris last year. I have prepared an illustration which we will throw upon the screen to convey a clear idea of it to your minds.

This section had a compact and collective appearance, and as such arrested attention. The exhibitors were chronometer-makers, turret-clock makers, and watch manufacturers by both methods; a school of horology, tools and materials, and literature, were also represented. It differed widely from that of previous exhibitions in many ways. Formerly the few exhibitors were scattered about, and their stands arranged with small counters for purposes of sale, justifying in some measure the Continental sneer, "that England is a nation of shopkeepers." In the present instance the very reverse was the order of the day, the firms exhibiting were of weight and substance (chiefly *bonâ fide* manufacturers), and were for the most part induced to do so from patriotic motives, endeavouring to counteract by ocular demonstration the feeling which had begun to take root in the public mind, that English watch and clock-making was a thing of the past.

The representative character of the exhibitors, and the substantial merits of their exhibits, greatly impressed the jury, and obtained for our section the unprecedented number of awards it received, namely, 200 per cent., including the collaborateur's medals—in fact, in point of merit, the Watch and Clock-Making Section stood before all others in the Exhibition.

In chronometry, Mr. V. Kullberg carried the palm from all competitors. Messrs. Dent, of the Strand, and Gillett and Johnston worthily sustained our reputation for public clocks, this last firm emphatically so. Messrs. Grimshaw and Baxter's exhibit of watch and clock tools and materials was large, and representative of the excellence of our products in this particular; while Messrs. Usher and Cole, Parkinson and Frodsham, and Webster, of Queen Victoria Street, showed that the traditional skill of Clerkenwell was still the best of its kind. For the first time, too, an English school of horology presented itself to the consideration of a jury, and we must note, in this new departure, a happy augury for our future. As tending in the same direction should be classed the translations into English of Saunier's text-books for schools and workshops, by Mr. Edward Rigg, jointly with myself.

But the exhibits I have selected to illustrate my conclusions to-night are those of the British United Clock Company, of Birmingham, as regards the manufacture of the cheap drum clocks (with which American and French firms have flooded the markets because of their singularly low price); and the old and important house of Rotherham, of Coventry, as regards the manufacture of standard types of English lever watches.

Passing to notice in detail the important display of Messrs. Rotherham and Sons in the exhibition, I may say that their exhibit was intended to show the re-organisation that English watch manufacture has undergone during the present decade, and the result is perhaps best shown by quoting two criticisms by foreign experts.

One was delivered by an eminent Swiss writer, who said of the English trade as represented at the Paris Exhibition of 1878:—"It is complacently asleep in the conviction of having raised limits which its rivals or successors can never surpass." The other criticism is taken from the *Revue Chronométrique* of November, 1889, and is from the pen of Mons. E. Antoine, one of the Besançon jurors, himself a watch manufacturer of the first rank. He says of this firm, in showing the application of machinery to watchmaking:—"It equals, if it does not surpass, its predecessors in every country." We have here a complete reversal of previously-existing impressions, and this should be highly gratifying to every Englishman.

The exhibit was in itself very simple; it consisted of a connected series of pieces of the movement, showing, step by step, the condition of each part as it passed, process by process, from the raw material to the finished work.

Every part of the watch was illustrated in this way, and so arranged as to convey a clear indication of the methods adopted, and in some measure of the machinery employed throughout the whole of the manufacture. In like manner the making of enamel dials, of gold and silver watch cases, and of pendants and bows, were exemplified; but simple as it was, it was readily seen by the jury that they had under their consideration as complete an organisation as could be found in any country. The various branches of watch manufacture were found to be all brought under one direction, and each of those branches had been revised in its methods by the introduction of automatic machinery of the latest type. By a series of photographs it was also seen that they were manufacturers of their own machinery and appliances, and it was elicited by the jury that in their tool-making a regular system of measurements and gauges secured the advantage of interchangeability in the lathes, engines, and general machinery of the place.

I have been able to obtain from Messrs. Rotherham a few photographs taken in their factory, from which I have made slides, which I will presently throw upon the screen to show the aspect of a modern watch factory; but before doing so I will try to make clear the essential difference between the old and the new methods of manufacture. It is generally known that in the very early days of watch-making the whole of the mechanism was the handiwork of some master craftsman, who designed and fashioned all its parts from crude metals, and even worked up the metals themselves, by his own peculiar treatment, into a condition of special fitness for his wants. This craftsman, with mechanical aptitude of the first order, was of good education and wide reputation, and such workmen were often retained by emperors and princes for the making of costly gifts. Note the conditions we start with here. The whole of the operations are concentrated under one roof and control, with a high level of education in the worker. After this time came the usual evolution, differentiation began, and slowly we find the making of the parts more and more subdivided, and specialists in the various branches combining their work to form the whole machine, resulting in a very great advancement in quality. Further divisions and subdivisions follow, also further raising of the standard of excellence, until the errors of time-keeping fell from five minutes a day to less than one minute a week.

But all this was attended by a greater and greater separation between the workers. Beginning by occupying different houses in a given district, and then different districts in a town, they eventually became distributed over the whole face of the country, until the loss of time in fetching and carrying became from 10 to 20 per cent. of the cost. Even this, however, was not the most serious evil. Absence of control gave rise to the much greater disadvantage of a loss of unity of proportion and of evenness of quality—excellence in one part joined mediocrity in another—this being discoverable even in the most costly watches; and, finally, the impossibility of bringing such a disconnected course of working under fixed standards of reference, or under a uniform system of exact measurement, brought about such a condition of things that at last a point was reached when the advantages of specialisation were balanced by the want of dovetailing in this disjointed and cumbrous procedure. Such was the condition of things up to forty years ago, when these drawbacks gave rise to the desire in many minds to get back the advantages of unity of control without losing the advantages springing from subdivision and specialisation; and this is exactly what has been secured by the new system of manufacture in large factories. The system is fundamentally sound and logical, because it secures the union of these advantages. The twenty odd branches of the trade are once more aggregated under one roof and control, and an extreme subdivision is set up, and the whole fabric linked together and governed by a rigid system of measurement for the size and proportion of every part.

The increased application of machinery, associated with this revised method of manufacture, excellent as its results are, is, one may say, almost secondary in importance to the re-organisation which this re-grouping of the trades admits of; but when the automatic processes are added to this re-organisation, we have the powerful weapon forged which gave the Americans, who early adopted it, a leverage in economic production which threw the old manufacturing centres of Europe for a moment into confusion and panic. The American companies were thus able to develop themselves on a vast scale, and to obtain almost complete control over their own markets before the other countries had time to reform. It is now difficult to dislodge them, although it has long been evident that with anything approaching equal manufacturing facilities, the old centres would once more invade American markets were it not for the existing heavy prohibitive duties. I will trouble you with one other consideration, as it is important to a full comprehension of the radical difference between the old and new ideas. It has been said that an extreme subdivision is made possible in the factory system; this involves as its corollary great quantities in manufacture. It has been further said that this specialising of the functions leads to increased excellence, but it has this further advantage that, for industrial purposes, it enables the creation of skilled labour in the least possible time. Take, for instance, the formation of a balance-staff-cone pivot: a lad can be taught to pivot a staff in two or three months in a style that would not be possible under several years' practice in the old order of things, and, from doing but this one thing he quickly obtains a dexterity that surprises, until it is remembered that he has made more pivots in six months than an ordinary watchmaker, in the old way, would make in a lifetime. This has been, I am afraid, a tedious explanation, but I hope I may have indicated the sources of the power that underlie the new machine system, and will proceed to put on the screen the few views I have of Messrs. Rotherham's works.

We have here a general view of the works of Messrs. Rotherham and Sons; they extend in three lines of buildings, some 400 feet in the rear of the roadway. The entrance is very unpretentious. The firm was established in 1750, and is the largest and oldest of the kind in England; it gives employment to 500 hands.

It should be pointed out that one of the special difficulties in establishing a watch factory is that—until quite recently—it was not possible to purchase the machines indispensable to commence the manufacture. It was necessary to begin by starting an engineer's shop in which to build up the tools and machinery, and to design these, to make the patterns, and to make a long series of machines, required some years of preparation. This is, then, the initial step, and I will therefore put on the screen a view of one of the tool-making shops of Messrs. Rotherham. Glancing at the interior of the work-room, you will observe it is furnished with the usual appliances of the mechanical engineer; all these are of the best kind, but the special feature of such shops in a watch factory is the series of standard gauges, verniers, and micrometers (which cannot be shown on the screen), for securing a close adherence to the exact measurement, which is a fundamental consideration in all automatic watchmaking machinery. A well-equipped tool-room is also a necessity for keeping the watchmaking plant in good condition.

We will now pass to a view of what is called in trade parlance the "plate room," where all the brass parts of the movement are turned and milled into the required form and size, the drilling and tapping of the holes, the steady pinning of the pieces, the planting of the position of each wheel, and the boring out of the recesses to receive the jewel holes.

The parts are received here from the pressroom where they have been stamped out to a given shape, and are here finished ready for gilding.

Girls are largely employed in these operations, as the machines, when set up to measurement by the foremen, are rendered wholly independent of the skill or judgment of the worker. Quickness, care, and cleanliness being the only requirements, gauges, verniers, and micrometers are *de rigueur*, to check wear and tear of cutter edges and points. Fines are imposed if anyone is found working without a periodic testing of their work by the standard. An independent office examination of the pieces when completed gives a further check to these precautions. This is one of the strong points of a factory organisation.

It is desirable to note here that an essential difference between the old and new methods shows itself at this point. There is no roughing the part out somewhat nearly to its right proportion, and then passing it on to another workman to re-make it smaller, to re-fit it, or to shorten it to right height and length, thus practically travelling over the same work twice. This was the custom formerly; but now a book of drawings of each piece is furnished to the foreman who has to set the machines, and therein a diagram and measure is given for every cut made upon the piece, so that it is reduced at once to the proper dimensions with quickness, directness, and the certainty that it will coincide with the part it is to be attached to. There is obviously a minimum waste of time in this way.

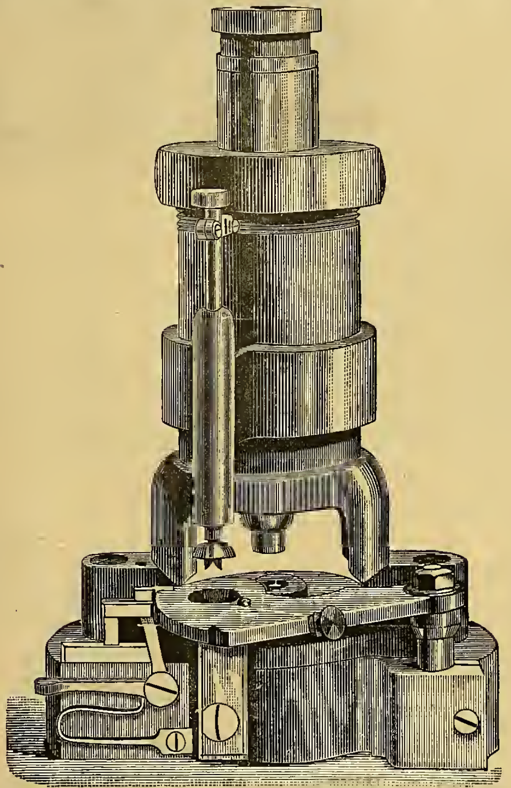


Fig. 1.—Sub-press Wheel-shaving Machine.

The next view introduces us to a similar group of workers, who are engaged in making the steel work of the watch, that is, the cutting of pinions, ratchets, springs, regulators, studs, and numerous steel pieces of strange shapes which constitute the keyless mechanism. The directness of procedure is again apparent in the fact that, contrary to the older plan, the pinions are at once turned to right height of head, the arbors to the right length between shoulders, and the pivots to right size according to the diagram of measurements furnished to the foreman of the department. No hesitation or mental debating as to proper size is called for; that has all been decided in getting out the original drawing and model from which the measurements are obtained, and action, and nothing but action, is now the order of the day. The general rule of this department is that all finishing operations are done by automatic machines, which only require the operator to feed in the "blanks." The approach of the cutter to its work, the travel, or feed, and the withdrawal of the cutter and the stoppage of the machine, and the completion of the operations, are functioned automatically, leaving the worker free to attend to several machines, or prepare the blanks, or cleanse them. The reason why these machines are not made self-feeding is twofold. Firstly, the minuteness of the parts, and secondly, the need of clearing the centres and surfaces of chucks and cutters after each operation, when dealing with such minute pieces and with such exact measurement.

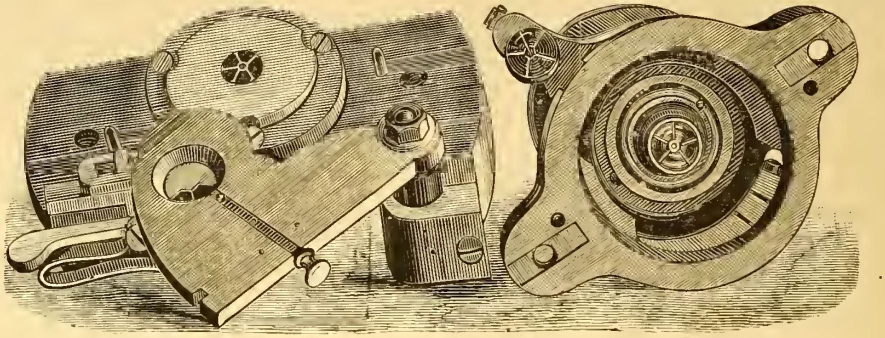


Fig. 2.—Portions of the Sub-press Wheel-shaving Machine.

Our next view shows one of the shops in which the workers are all skilled hands engaged in putting the parts of the watch together, and in timing and adjusting, and casing the movements. Here, apparently, all noise and bustle is gone, and quiet concentration pervades the place. To give an idea of the proportion of these workshops, I may say this one is 180 feet long. Speaking of timing and adjusting, I will mention that Messrs. Rotherham receive the time current daily from Greenwich for this purpose, and that the low, middle, and high temperatures are obtained by refrigerators and ovens placed under ground, and kept within a variation of one or two degrees Fahrenheit all the year round.

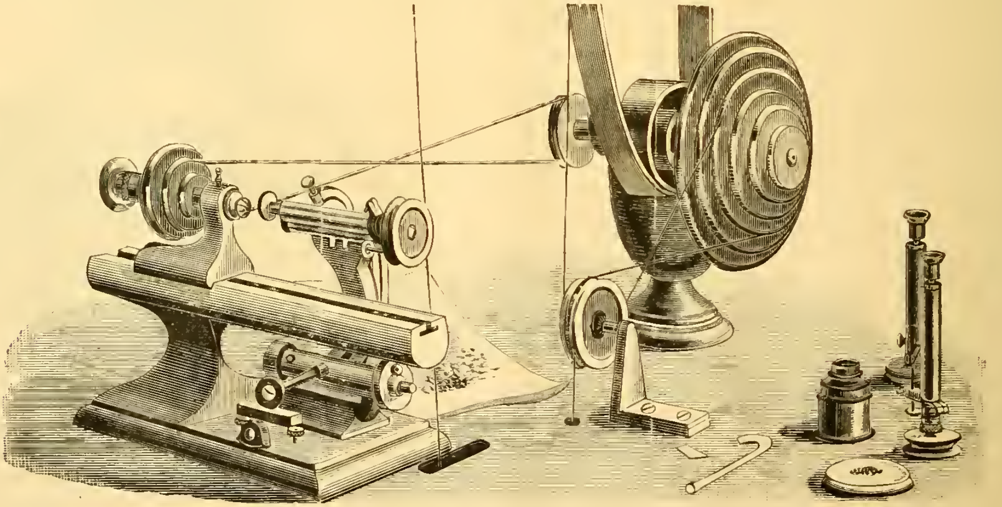


Fig. 3.—Balance staff Pivotting.

In illustration of the kind of economy obtained by the latest labour-saving appliance, let us take the case of a wheel, that most important element in a watch. A watch wheel has four, five, or six arms or spaces, formed to give lightness to it, and these are stamped out in a press, and in cheap watches it is left so, but the act of stamping out these spaces leaves a very rough, torn surface where the metal parts, and hitherto it has been the habit to laboriously file and scrape the surfaces of every arm, web, and boss to give squareness and finish to the object when completed. This required some skill, and is a costly operation of a minor kind; but I will now throw upon the screen a new kind of sub-press or cutting instrument (figs. 1 and 2) which is devised to cut just a thin shaving off all the twenty sides and surfaces of a five-armed wheel at one stroke, and the operation, including the fixing of the wheel, is accomplished in less than 30 seconds, and, what is more, leaves the wheel in perfect poise. I have a second slide of this sub-press in pieces to show that it is a somewhat elaborate apparatus. The whole of the parts are fitted by a slow process of polishing when hardened, and which, coupled with the fact that it must be related to the previous punch, which forms the spaces by very exact measurement, makes this a very costly tool.

Messrs. Rotherham's is the only place in England where this is practised. I have on the table here a sample wheel, which may be inspected and which is the eight-thousandth wheel so finished without any sharpening of the apparatus, and you will be able to judge of the precision it shows.

The formation of the pivot of a watch is an operation of the first importance, and I therefore place on the screen a photo (fig. 3) of the apparently simple machine in use for this purpose at the factory at Coventry. The principle on which it is built is the recognised one for securing perfect roundness—viz., the work revolving one way and the polishing disk rotating at high speed in an opposite direction. The driving band or gut, it will be observed, is arranged to take off all side pressure on the spindle, and this leaves the "feel" or touch of the worker's hands unimpaired. A device consisting of an inclined plane and roller is added at the base of the machine, which by adjustment will give any desired taper to the pivots. The pivotting is all done to ruby holes of standard sizes.

In illustration of the control in detail made possible in the new system, I put on the screen a machine (fig. 4), the sole function of which is to repair the polishers used on another line of machines, in order to insure uniformity of form when the polishers require renovation from slight distress in wear.

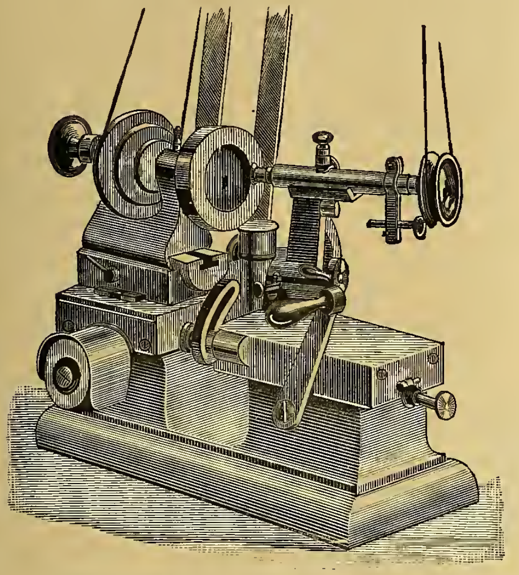


Fig. 4.—Cone-Pivot Polisher and Shaping.

This machine is used to preserve a uniform shape on the cone of balance pivots, and is simply a type of a line of tools existing in a well-organised factory, to preserve unchanged the curves and angles of polishers and cutters under the strain of constant use and repairs. Running in a head-stock is a revolving abraser which may be either a file or emery disc. To this is presented the polisher, mounted in a holder having a circular motion. The radius of the curve given to the edge of the polisher is regulated by the distance it is fixed from the centre of motion of the holding frame, and this distance is an adjustable one.

Perhaps there is no part more difficult to deal with by machinery than the pallets of a lever watch, and especially is this so in the form which it assumes in an English lever, where, for the purpose of being secured against any sort of accident, in use or repair, the slips of ruby are encased in steel ; in most cases the difficulty has been evaded by adopting some other form more convenient for the application of machinery ; but Messrs. Rotherham were very desirous of preserving this distinctive feature of the English watch, and, after a rather considerable outlay in experimenting, they were able to produce a line of tools which gave excellent results, and I will next show a view of the semi-automatic cutting engine (fig. 5), for forming this English form of pallet. Here the whole of the nine angles that have to be cut are expressed on a dividing plate, and the blank pallet (mounted on its pallet hole and the two lever pinholes) is cut to these angles, all in absolute relation to one another, in the same manner that the teeth of wheels are cut ; the three cutter spindles that revolve are shifted by hand as each cutter is brought into action, but the eighteen stops required and geared together are all moved automatically by the up movement of the cutter handle. The motive in the design of this tool is that the angles cut on the pallets shall not depend upon any angle given to the cutters, but be cut by square-faced cutters easy to produce. Similar devices permit of the polishing of these faces after the insertion of the slips of ruby.

The operations of working the precious metals are necessarily directed to guard against waste, and to this end to do away with filing or scraping, or the making of shavings by turning, or any operations which, by producing dust or minute fragments, result in loss ; and further, to do away with soldering the parts together, as this involves filing or dressing in some way the points of junction. The modern method, therefore, is to treat metals as plastic material, and force them by pressure into the required forms and thicknesses. To illustrate this, I show the formation of a part of a watch case as made at Messrs. Rotherham's works. The metal is rolled down into a ribbon of given thickness, and then a disc of a calculated diameter is stamped out and then fashioned into a cover as follows :—A disc (fig. 6) is placed in a cupped die under a strong screw-press, and a stamp of corresponding shape with one blow turns up the disc into the form shown in fig. 7. A second stamping turns over the edge a little for the snap, as in fig. 8. A third continues the formation of the snap, and completes it as in fig. 9. The die used in the foregoing operations has a groove to correspond with the bead required on the bottom, but as yet the bead is not well defined, and therefore a stamp is now used, the contour of which, instead of following closely the outline of the die, bears hard on the points where the beads should be. A blow from this gives the requisite fulness and sharpness to the bead, as shown in fig. 10. Well and uniformly shaped bottoms are thus produced without soldering. The snaps and outer surface of the bottom are skimmed in the lathe. However necessary turning might be for the snaps, it seems like painting the lily to apply the lathe tool to the already smooth and finished surface of the remainder, but the silver would not yield the particular high polish desired unless the skin of the metal were first removed.

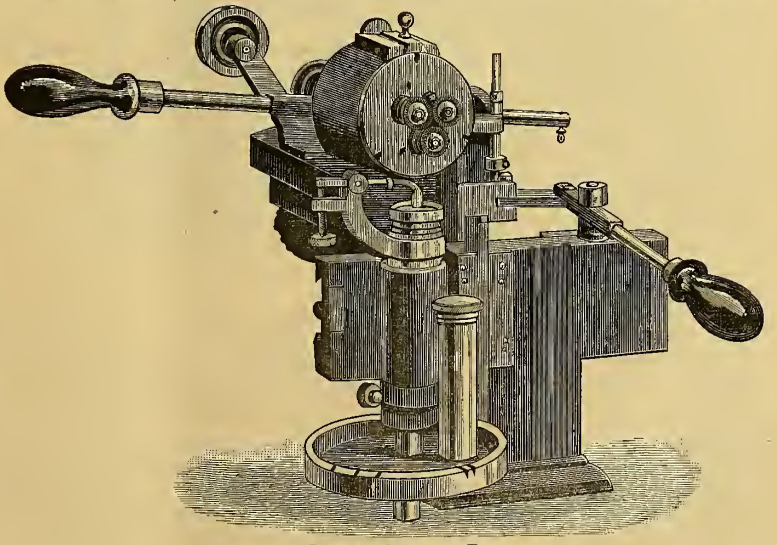


Fig. 5.—Pallet Cutting Engine.

The making of machinery for gold and silver cases is an industry which has kept pace with that for dealing with the watch movement, and I here present a view of a tool designed by Messrs. Rotherham to cut the spaces and recesses into which the knuckles or joints of the case are to be soldered. These spaces are cut by a revolving cutter (fig. 11) at a fixed distance from each other, by means of a dividing plate, and a novel invention is introduced into the machine for securing the truth and accuracy of the depth of the hollows in spite of the twisting of the case under the heat of soldering. This spacing on a dividing engine, and providing for the distortions of metal in soldering, strikes one as refinement in manufacture.

The British United Clock Company is a company formed for the production of cheap lever drum timepieces and alarms, a work hitherto monopolised by foreigners, and in the short space of five years they have successfully checked the importation of these goods. The production of the company has reached 500 clocks per diem. This may appear a large number, but is comparatively trifling compared to the demand.

The best appliances have been laid down, and the factory, although it covers 1,250 yards, and is fitted with engines of 70-horse power, as yet only covers one-third of the ground acquired for future extension. An excellent machine-room is established for making dies and machines, and for repairs. This and an extensive press-room are fundamental requirements in such a manufacture.

A simple recital of a few of the operations in making these clocks may interest those unacquainted with the care and precautions made possible in large works, even where the goods are sold at the singularly low price at which these clocks can be obtained. The wheels have their teeth cut in an engine in place of being stamped out, and the pinions are no longer made from "drawn" pinion-wire, but are also cut in an engine, three cutters in succession traversing each leaf, and they are then subject to a certain degree of polishing. The mainsprings are tested individually after hardening.

There is a very neat invention in connection with the winding of the Speedwell alarm. The great wheels of the going and alarm trains are mounted on the winding arbor, one on each side of the mainspring, which serves to actuate both. The wheels are loose, and driven by ratchets and clicks to allow of the arbor being reversed to wind the spring, the outer end of which is attached to the great wheel of the going train. When the alarm is let off, the force of the spring will cause the winding arbor to turn and carry with it the great wheel of the alarm train. But the problem is to lock the spring again when the alarm has run its course. On the winding arbor is a pinion with coarse teeth taking into a segment having a strong butt, which forms the alarm stop. In winding the piece, the first turn of the winding arbor winds the alarm stop, if it is down, and a missing tooth in the segment allows the winding of the going train to proceed in the usual way. This will be made clear by an inspection of figs. 12 and 13, where the wheels and segment are shown as they appear before and after winding. There is, it will be observed, a light spring, which presses against a pin in the segment when it is wound, thus keeping the butt away from the pinion, and ensuring the engagement of the pinion and segment teeth when the alarm is let off. The arrows in fig. 12 indicate the course of the wheels in winding, and the arrow in fig. 13 the direction in which the segment will move when the alarm is in action.

In evidence of the thorough-going way in which the company uses every modern aid in furtherance of its work, I may mention that the cases of these clocks and the ornamental dials are prepared for gilding with that peculiar soft grain known as "satin mat" by the use of a steam sand blast, the process being as follows:—The object is placed in an air-tight box and over the orifice of a pipe containing the sand, the box is then exhausted of air and a jet of sand impinges on the metal, and in a few seconds it has the desired mat.

The energetic way in which the management attacks the difficulties that arise is shown in this fact, that, finding the brass supplied in Birmingham is not so good for the purpose as that obtainable in America and Germany, because the sulphur from the coal used in annealing injuriously affects the surface of the metal, and shows itself as an uneven surface after being "dipped," it is now preparing plant to make brass with the object of overcoming this defect. Such great energy and enterprise as I have alluded to leads one to understand how, in the short space of less than five years, this company found itself strong enough to venture on competition with the whole world in an international exhibition, and in the opinion of many competent judges did so more successfully than even their Paris award indicated.

There is here a lesson of what may be accomplished by a union of intelligence and energy on the one hand and capital and commercial capacity on the other, for it must always be remembered that it is not enough to make the goods, but that to distribute them with sufficient rapidity and volume is an essential of success where great producing power is developed.

I hope this hasty glance at these few details may have served to convey an idea of the manner in which watches and clocks are produced by the new method, and that you will perceive that it is not of the nature of a new discovery, but rather a development from our past, and that, as is common in such a case, is attended by an increasing complexity, which requires greater grasp and width of knowledge, and more organising power on the part of those who conduct it. The superintendents, foremen, and sub-foremen of the various departments have not only to know all that appertains to their own proper business, but to deal with the details and functions of the complex machinery set in motion to produce these watch parts, and they have, further, to conduct operations on a much larger scale than has been the custom hitherto. All these requirements demand new facilities for acquiring this special knowledge, and imperatively call for the specialisation of theoretical training in schools equipped with a proper range of teaching appliances.

Our continental rivals have long recognised this fact, even before the advent of this complicated machine system, and the magnificent display of their ten horological schools at Paris last year testifies to the importance attached to this educational machinery abroad.

It is true that for the first time in our history we had a Clerkenwell school exhibiting side by side with these foreign schools, but the comparison naturally showed our weakness and the great advantage it is now to the foreigner that he established these training centres a generation before us.

Full details concerning these foreign schools will be found in a small work on "Horology at the Paris Exhibition," which I have now in the publisher's hands.

The necessity for these schools amongst us has become so great of late, owing to the gradual decrease of the apprenticeship system, that we are not without some movement in the desired direction, for a second school has been established in London and one at Edinburgh; while Coventry has, within the last two years, established one in connection with the technical institute in that city. But in view of its supreme importance this matter moves too slowly with us, and it is to be hoped that the energy and thoroughness which distinguishes the English character will display itself in anxiously promoting and fostering schools of horology.

These remarks bring me to the conclusions at which I have arrived after a careful study of the horological display at Paris.

I find that in comparison with our competitors our position to-day stands as follows:—

1. In chronometry we are supreme.

2. In two or three branches of the clock trade we have a decided lead.

3. In the manufacture of the cheaper kinds of clocks, we show a successful and hopeful new departure.

4. I find that the cost of our best grades of adjusted watches is now as moderate as is the corresponding grade of foreign work, while the gradual elevation shown by the timing records at the Kew Observatory trials testifies that their excellence is being steadily advanced year by year.

5. The records of our deck watches under the severe trials of the Greenwich Observatory show performances unequalled in the world.

6. As I have shown, in the important matter of watchmaking by machinery we have, during the past ten years, vigorously pushed ourselves to the front rank in quality and organisation, for, besides the large factory of Messrs. Rotherham, we have in London those of Messrs. Guye and Company, and Nicole,

Nielsen, and Company, and two in Birmingham—that of Messrs. Erhardt and Company and the English Watch Company, and besides this a new organisation is now arising in Coventry, while only last month Lord Derby attended the opening ceremony of the New Lancashire Watch Company in the village of Prescot, a very old seat of watchmaking.

Now, taking the contrary impressions, I am struck with the, to me, unmistakable evidence that the following points of advantage which the foreigner appears to have over us is closely, if not solely, related to his having so long possessed those specialised educational advantages we are in the habit of speaking of as technical instruction.

In the first place, then, he is decidedly superior to us in the variety and flexibility of his manufactures, in the wealth of his style, and in the beauty of his decorations.

2nd. In many branches of clockmaking, notably in mantelpiece clocks, where the decorative art comes into play, he holds a decided monopoly.

3rd. In the application of electricity to horology he is considerably more advanced than we can claim to be.

4th. In all that relates to the synchronising of timekeepers, whether by electricity or pneumatically (although perhaps this is debatable ground), I fear we must grant the foreigner a foremost place.

In considering these four points, I venture to reiterate the thought that they are all more or less related to the widened mental condition that comes from especial training in the science and technics of the art. I have estimated that the ten schools exhibiting in Paris have during their existence trained more than 7,000 students, who have passed out and taken positions in the trade as manufacturers, foremen, etc., and thus become centres for extending the knowledge they have acquired.

Consider for a moment the combined influence of this small army of trained minds in strengthening an industry, and what wonder if we find ourselves at some disadvantages in comparison. Still, notwithstanding all this, the review of our position to-day is full of hope.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.—Case Bottoms.

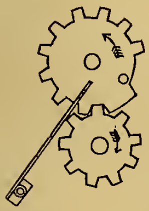


Fig. 12.

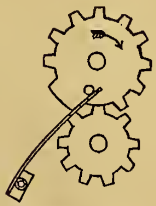


Fig. 13.

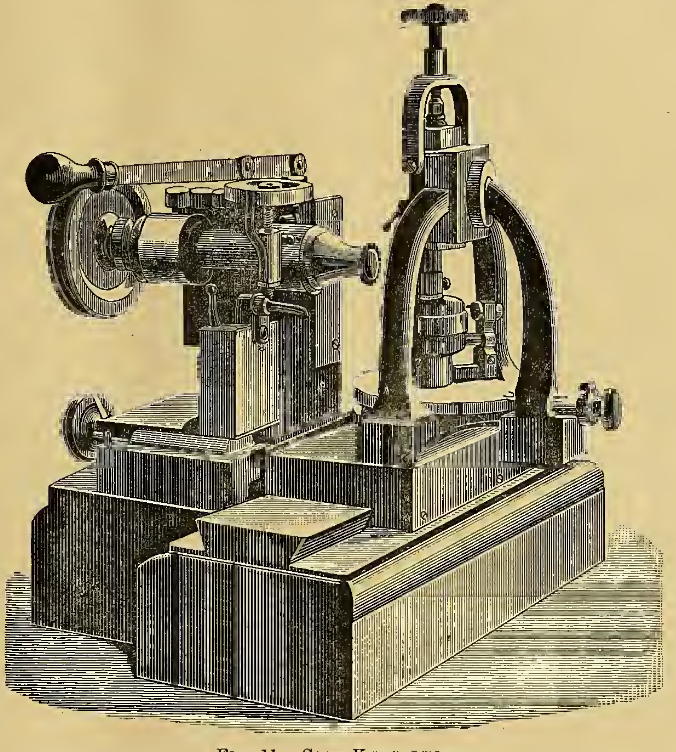


Fig. 11.—Case Knuckling.

We see that in timekeeping excellence, and in manufacturing energy and organisation, we may claim much.

Although we have not in this country yet turned our attention to the manufacture of those cheap varieties of watches which make such a show in statistics when comparison of output is made by numbers, yet all this will follow when the organisations that we see planted to-day are developed, as they must be in time. It is useful in this connection to note that the foreigner cannot sell in this country watches of the same grades as those which our English manufacturers devote themselves to making, they are perforce driven to supply us with such goods as our own makers do not attempt to make. It may, therefore, be assumed that the same consideration will rule when English makers descend to the lower grades and make those other sizes of watches which constitute the bulk of our importations. Moreover, that the success in their respective courses of the two firms specially mentioned to-night ought to incite others to attempt in this country the manufacture of the medium grade of clock now so largely imported for house use, and also a cheaper kind of watch than is yet attempted by Messrs. Rotherham and Son, to stem the importation of foreign goods which yet takes considerably over a million pounds sterling annually out of the country.

Finally, although I have had no startling discoveries to record calculated to strike the imagination of the public, yet the collective development and the improvement in detail shown in so many directions bears witness, I think, to an inventive activity and a manufacturing energy that maintains for the art of watch and clockmaking in this country a foremost position in the horological world, and gives promise of a great extension of these manufactures in England in the course of the next ten years.

DISCUSSION.

The Chairman said he should like to slightly supplement Mr. Tripplin's remarks on the British section in the Paris Exhibition before inviting a general discussion on the paper. The Horological Department was a very important contribution to the success of that section, and it was only right to add that the existence of any horological department was entirely due to the energetic and self-sacrificing labours of Mr. Tripplin, who came to him when the committee were endeavouring, under great difficulties, to organise a fitting representation of British industries in Paris, and said he was determined that the British horological industries should be well represented. He brought all the pressure he could to bear on his friends, some of whom were rather lethargic, and at last succeeded in inducing a number of representative men, connected with clock and watchmaking, to come forward, and in the result there was a very scientific and excellent collection of British horology. When it came to the appointment of jurors, it was pretty evident that there was no one better fitted than Mr. Tripplin to represent this country in horology. He had the facility of speaking French, which was very essential, and he took a prominent part in the work of the jury, not only in obtaining awards for our own country—which was not the proper business of a juror—but in ensuring that proper consideration should be given to the merits of the different countries, and by seeing—which was the function of the juror—that the representatives of his own country were not overlooked. Several points in the paper suggested discussion, such as the amount of machinery which could be usefully employed in the construction of watches, and how far we were following other countries, especially America, in the application of machinery for such purposes, and to the different grades of watches. He did not quite agree with Mr. Tripplin and his implied disparagement of cheap watches, because it was of great importance to a poor man that he should be able to procure a reliable timekeeper, and for that they were greatly indebted to the energy of American manufacturers, as was shown some time ago in the paper by Mr. Waldo on the American watchmaking industry.

Mr. Harrison said Mr. Tripplin remarked that England was behind her foreign competitors in the matter of synchronising clocks, but, as some present knew, a good deal had been done in that direction, and a good deal more would have been done but for the action of the Postmaster-General, who insisted that £15 should be paid per year for every clock synchronised according to Greenwich time. Last year he paid his £15 for the use of the current, and proposed to employ it for synchronising a number of clocks; but the Postmaster-General said he did not know whether that current was used for one clock or whether it was utilised to synchronise 500 or 5,000, and it could not be permitted, unless they got £15 for every clock synchronised. Forty years ago he attempted to do the same thing for the International Telegraph Company, and partially succeeded, but partially was not enough The mode now adopted was a simple piece of mechanism put in any ordinary clock, and that could be made to synchronise all clocks by Greenwich time. Some years ago he set up a clock at the Horological Institute, when Mr. Cole and Sir Edward Beckett Denison (now Lord Grimthorpe) said that was the thing required.

Mr. Samuel Jackson said he accompanied Mr. Tripplin to Paris to place the exhibit of the British Horological Institute there, and he felt personally grateful to him for the paper he had read. Although he had referred to two firms only, they were the most prominent, commercially, in this country; but the illustration given in no way touched Clerkenwell manufactures—the watches of precision, and scientific instruments. Still, it was a commercial question, as well as a scientific one. Mr. Tripplin had made it clear to all unbiassed minds that the greatest honour was due to the British Horological Institute, of which Mr. Tripplin was vice-president, and in representing which institute he went to Paris. But for that institution there would have been no watchmaking exhibit there of any value with the exception of the Rotherham firm and the Birmingham factory; but the finest exhibits were from members of the institute, which also paid the expenses attending the establishing of Mr. Cole's School of Horology. That institute was a valuable institute long before technical education was spoken of, and it was unlike the schools by which their foreign competitors had been enabled to go ahead, having no public subsidy. It was established by men like Mr. Glasgow, Mr. Jones, and himself, working watchmakers, who had to depend upon their own exertions to support and maintain a technical journal, which had now been done for thirty years. It was a public work which he thought Englishmen might be proud of; but now, thanks to the City Guilds and the Goldsmiths' Company, they were endowed to the extent of £300, had two professors and thirty-five students, and they were continually turning out an army of expert and scientifically trained men, thus ensuring the high character of watch manufacture.

Mr. Bedford (Waltham Watch Company) congratulated Mr. Tripplin on his paper, and said the photographs of the Rotherham Company's factory almost made him think he was at Waltham. He agreed with the remarks of the chairman, and regretted that Mr. Tripplin had not given his company the credit which he thought was due to them. Machinery in watchmaking, carried right through the manufacture, was hardly known in Europe until it was shown in the Philadelphia Exhibition, and M. Favre-Perret, the Swiss Commissioner, was the first to raise the note of alarm when he came back from America. He called together the Swiss manufacturers, and told them the perilous position they were in, and this was the starting-point of the revival in the Swiss manufacture. The English, however, did not take the hint, and the second note of alarm which impressed itself on the English makers was the Waltham Company's exhibit of machinery at the Inventions Exhibition. Mr. Hewitt, manager of the Prescot factory, when he was in America, was received with courtesy by the president of the company, and conducted over the works, and on his return visited him (Mr. Bedford) at his offices in London, and spoke of his desire to obtain a plant which was then for sale in America, which, however, was afterwards sold to another company. He had the best information, however, that the Prescot factory would be largely supplied with American machinery from Waltham. Mr. Tripplin had referred to European watchmakers being handicapped in supplying the American market by the heavy duties, but he really thought the less said about that the better. How was it that for fourteen or fifteen years his company had been in England selling watches in competition with English and Swiss makers, although they had to pay duty on the steel and other raw material which they imported, which, however, was not of much importance. The great unit of manufacture was labour; they had nearly 3,000 hands at the factory, and their pay roll was about £30,000 a month. If free trade was introduced into America the price of clothing and nearly everything the labourer had to buy would be immensely reduced, and the wages would be probably reduced fully one-third. If, then, their pay roll were reduced from £30,000 to £20,000 they would be in a very different position. At present, while the total British exports amounted to something like 240,000,000 or 250,000,000 annually, those of the United States were only 25,000,000, and that was not because their labour was inferior in any way, it was simply on account of the high rate of wages owing to protective duties. He was a free-trader, unlike many of his countrymen, knowing that if free-trade were adopted the flood-gates would be opened for the exports of the United States, not with Great Britain only, but with the colonies and every part of the world; and America would become the keenest competitor England had ever had. He had crossed the Atlantic thirty or forty times, and in his intercourse with merchants going to and fro he found they always admitted, when they had investigated matters in the United States, that the import duties, instead of being a disadvantage to Great Britain, were the reverse, and that the longer the States stood by protection, the better it would be for the British manufacturer. He gave evidence before the Select Committee of the House of Commons on the Trade Marks Act, and did all he could for the protection of the British watchmaker and to denounce the importation of watches here which were palmed off on the public as being English-made. He considered that such dealing was a fraud, and that every watch movement coming into this country should bear the mark of its origin upon it. He should always do all he could to assist the British manufacturer in securing honest and fair trading.

Mr. Gooding (Messrs. Rotherham and Co.) said it was hardly correct to say that the English manufacturers first recognised the necessity for machinery at the Inventions Exhibition. Mr. Bedford knew enough of the time required to establish such an organisation, as had been shown on the screen, to know that Messrs. Rotherham must have commenced much earlier than that. It was true that American companies sold watches in this country, but, as had been remarked in the paper, they sold a class of watch which the English manufacturer did not attempt to make, and they did not sell in any quantity the grades which were made in England. The Swiss importations in America had risen during the last few years by leaps and bounds, and factories were established in Switzerland for the express purpose of supplying the American market, thus showing that, when similar appliances were introduced here and there in the old centres, they were able to compete successfully with the Americans, even on their own ground. He inferred from a remark of Mr. Bedford that he intended to convey that England was dependent upon America for watchmaking machinery, but such was not the case. At Messrs. Rotherham's factory about 5 per cent. of the machinery was American, but the remaining 95 per cent. was not only manufactured but designed by the firm, and completely departed, in important particulars, from the American practice. The same claim was made for priority in the application of machinery, but the Swiss indignantly denied it. He saw and conversed with M. Favre-Perret on his return from Philadelphia, and though it was true he raised a note of alarm in order to quicken the minds of his countrymen, he did not consider that the Swiss industry was really imperilled. They were handicapped by the dispersed and disjointed state in which the machinery in Switzerland was at that time being worked, and he vigorously pointed out the need of aggregating it under one management, and the great economy resulting from such centralisation; but the moment that deficiency was supplied they were again able to come to the front. Even if American wages could be brought down to the rate in the old countries, which was very doubtful, there was still the advantage on the side of the Swiss of having a large army of trained labour. On the whole, therefore, he would repeat that the American watch, as sold in England, was a thing which the English, French, and Swiss did not make; and it therefore found a certain sale, as filling a gap in the public demand. The recent introduction of machinery here would fortify the position of the English manufacture relatively to the American, and probably the importation of American watches would soon be checked. Five English factories had been started, and were, more or less, on their feet, and on the whole, therefore, he could echo the hopeful tone with which Mr. Tripplin concluded his paper.

Mr. Fisher said he should almost have gathered from Mr. Bedford's speech that it was time for the English to give up watchmaking to the Americans entirely, but he could not concur in that view. He had been to America and had seen their factories, but he came back still nursing the idea that the Britisher was not quite played out yet. Every praise was due to the Americans for the energy they had displayed, particularly the Waltham Company, but there were other people who possessed equal energy, and he thought an Englishman was about as good as any one else, especially if he would get rid of that self-complacency which sometimes landed him in a difficulty. It was quite true that a large proportion of their own machines and tools had been purchased in America, because when a factory was started it was necessary to make it pay almost immediately, and for that purpose it was necessary to get things forward, and, therefore, tools and machinery were purchased in the best market, which happened to be America. The company in which he was interested purchased some tools there, but now they were established and could produce things equal to anything in the world, they were making their own tools and machines, and not only so, but they were designing them and improving upon them. Five years was nothing in the establishment of a manufactory of British clocks and watches, and in the course of ten or fifteen years he held a wonderful development would take place, and the trade would be in as good a position as in any other country in the world.

Mr. Tripplin said it was quite true that the success of the Paris Exhibition was in great part due to the school of the British Horological Institute, and he was much indebted to Mr. Jackson for the warm support he gave him on the council. He was also grateful to him for having referred to that school more at length. His object, however, had been to point out the most striking features of the British exhibit. In reply to Mr. Bedford, Mr. Tripplin said he was not there to fight with the Americans, but to represent the English section. He had, in common with Mr. Bedford, a love for fine watchmaking. As far as American machinery was concerned, he must be excused if he felt rather incredulous respecting their priority, remembering as he did what he knew was in existence in this way at Cluse, in the Haute Savoie, and what he knew of the efforts in this matter by Ingold, Lechot, and Vacheron before the Americans were heard of. He thought Mr. Gooding had answered the other arguments of Mr. Bedford.

The Chairman, in proposing a vote of thanks to Mr. Tripplin, said it could hardly be doubted that the country of Harrison and Earnshaw was still capable of taking a good position in scientific horology, whilst it had been shown that we were taking a very excellent place in the commercial branch of the art. The value of international rivalry, friendly, but none the less vigorous, had been amply shown in the discussion.

The Annual Meeting of the Birmingham Jewellers' and Silversmiths' Association.

THE second annual dinner of the Birmingham Jewellers' and Silversmiths' Association was held at the Great Western Hotel on the 8th ult. The chairman of the association, Mr. J. Millward Banks, presided, and there was a numerous and distinguished assembly, among those present being the Right Hon. Joseph Chamberlain, M.P., Mr. G. Dixon, M.P., Mr. W. Kenrick, M.P., Mr. J. Powell Williams, M.P., and Sir T. Martineau; Councillors C. Green, W. F. Green, Jacobs, Allen, and Bradley; Messrs. John Bragg, J. W. Tonks (hon. secretary), B. H. Joseph, Henry Payton, James Adie, Whitworth Wallis, H. Buckley, E. R. Taylor, P. H. Levi, Allen Edwards (secretary), Luke J. Sharp, G. C. Haseler, W. Ehrhardt, W. J. Ginder (treasurer), Walter Best (vice-chairman), H. Griffiths, William Johnson, S. J. Porter, F. Nathan, R. H. Jones, Lionel Spiers, Ben Nathan, S. Lyon, John Barnsley, W. H. Lord, H. R. Wright, J. Wainwright, Henry Westwood, and Ellis Nathan. Letters of apology for non-attendance were received from the Mayor (Councillor Clayton), the Right Hon. H. Matthews, M.P., Mr. Jesse Collings, M.P., Mr. J. A. Bright, M.P.; Councillors Thomason and Winkles, and Messrs. William Gibson, F. Elkington, W. Westwood, C. Westwood, F. W. Turton, J. Allday, jun., J. H. Mole, and G. H. Johnstone. After the usual loyal toasts,

Mr. Joseph Chamberlain, M.P., who was received with enthusiasm, proposed "Success to the Jewellers' Art." He said: "Mr. Chairman and Gentlemen,—I thank you for the cordiality of your reception, and I can assure you that it is a great pleasure to me to find myself once more in the company of so many of my fellow-townsmen, and especially of so many of my own constituents. I have come down, as you know, specially from London, I may say specially to attend this meeting. I have left the House of Commons rather languid after a week's debate, which has been occupied chiefly in the performances of all the lawyers in the House, who have fallen foul of one another, to the great edification of all the laymen. And, gentlemen, I will say that I rejoice, after this display, to find myself once more in the tranquility and the harmony of the Jewellers' Association. I have been asked to propose 'Success to the Jewellers' Art.' I do so with the greatest pleasure. I have a sincere interest in the success of the art as one of the staple trades of Birmingham, and one in which so many of my constituents find a living. I rejoice to think that the signs of the times are favourable, and that the improvement in trade, which was so marked during last year, is likely to continue. And if it continues I cannot doubt for a moment that your industry will have its fair share. At the same time I admit that you are in one respect at a disadvantage, because, unlike most other industries, your products are almost imperishable. And when I think that this manufacture has been going on for I know not how many ages; when I think of the immense stock which must be somewhere or another accumulated, it is a constant wonder to me that there should still be an increasing demand for more. Your trade is, I believe, one of the oldest, if it be not the oldest in the world. I remember in a foreign museum I once saw an old print representing Adam and Eve in Paradise. Gentlemen, Eve was clothed with a necklace, and with nothing else. I don't believe there was any time when attention was not devoted to personal adornment, and I am inclined to think that women found out that that was a necessity before men discovered the importance even of arms. Under these circumstances you will understand my reflection. You will see that there is reason for my surprise that while from the commencement of the world, or at all events since it was inhabited, the manufacture of personal ornaments has gone on, and that still the cry should be for more. I have said that your work is almost imperishable. When I was in Egypt, I saw in the great museum at Gizeh, among the Egyptian antiquities, a complete set of jewellery belonging to Queen Aar Hotep, who lived about 4,000 years ago, and there was still in existence a complete paraphernalia of a lady of the time of Abraham. When I was at Athens, Dr. Schliemann showed me, in his own collection, and in the museum there, jewellery which he had discovered in tombs, which he believed to be contemporaneous with the siege of Troy. The jewellery I saw then, if the learned doctor was right, may have been worn by Helen or by Hecuba, or it might have been similar to such as the pious Æneas would have carried across the seas as a present to Dido. And, gentlemen, you must not think that this ancient art was barbarous or savage. Not at all. It was almost modern in many of its characteristics. In these collections you will find all the staple articles of your trade—diadems, bracelets, neck chains, brooches, rings, pendants, crosses, stars, chains. All these things your ancestors—if I may venture to call your ancestors those who lived 4,000 or 5,000 years ago—all these things your ancestors wore, as you do. And the processes of your manufacture were known to those old workers in precious metal. There you would find hammered gold ornaments, *repoussé* work, incised work, engraved work, chaste work. You would find soldering practised as it is to-day; you would find the intermixture of precious stones with the precious metal, and I am bound to say I think the workmanship could not be surpassed, if it could now be equalled. In only one respect have we some advantage, I believe, and that is in our dealing with precious stones. Those old Egyptians, some of the Orientals generally, seem to have used the precious stones without cutting them, and now we have added very much to their effect by the setting we give them and by the use of the lapidary. In comparison with all this ancient work the trade of the jeweller in this country is in its infancy. I believe that its first introduction on any considerable scale was in London, when the Huguenots brought it from France at the time of the persecution of Louis XIV. Let me make a remark here in passing. Nowadays there is a party in this country which is seeking, no doubt with the best intentions, to exclude what it calls foreign pauper labour from the English labour market. All I can say is, if foreign pauper labour had always been excluded from this country, some of our most valuable industries, which at the present time afford employment to large numbers of our local people, would never have been known in this country. Our jewellery trade in England, especially in Birmingham, is an infant. So far as Birmingham is concerned, I believe it is an infant of about eighty years old. Though so young it cannot be denied that it has already made wonderful progress. Here is a great and increasing trade, which supplies not only the home market but the colonies and America, and to a considerable extent foreign countries also, and everywhere, I know, English jewellery has a reputation for perfection of mechanical workmanship, for solidity, for honesty of material, and for design. I don't think it would be possible to say that up to the present time it has had an equal reputation for excellence in taste and beauty. Therefore it is that I attach so much importance to what is one of the great works of this association. Therefore it is I rejoice to learn that so great a success has already attended your efforts. You are endeavouring for the first time in the history of the trade to educate the workmen engaged in it in the principles of art. If you succeed—and I don't know why you should not—you will have introduced into an English trade the conditions which have created a special and an unique excellence to Oriental art. You will have given to every individual workman the power by himself to make the best of the materials entrusted to him. And you will perhaps have created that instinct which leads the foreign workman—the result of whose labours we all so much appreciate—which leads him to reject everything which is false and inharmonious, or vulgar, either in form or design. It is an experiment you are making. It is to your credit that you are making this experiment, and I think the success which has already encouraged your efforts may encourage you to proceed. I hope the time is coming when to the super-excellence which everybody acknowledges in British workmen with regard to everything in the nature of mechanical labour, there may be added also, among other things, their natural and developed taste. Gentlemen, there is one other disadvantage under which, I think, your trade has laboured. You remain, after almost every other trade has been relieved—you remain fettered by the remnants of the old system, the old false system of taxation. You are subjected to the restriction imposed by legislation in the shape of the system of compulsory hall-marking—you are subjected to exceptional taxation. Nobody, I think, approves in principle of this taxation. It has been condemned by successive Governments and successive Chancellors of the Exchequer. But none have hitherto found their way to get rid of it. You know I have done what I could to promote what I believe to be your views, and what I am sure are your interests in this matter. I have represented these things to those in authority. I had a long correspondence with the Chancellor of the Exchequer last year, and since my return I have seen him again. Of course I could not ask Mr. Goschen—and he would not have told me if I had asked him—what is to be the nature of his Budget of the present year. But I am authorised by him to say to you that he has carefully considered the representations made to him as to the anomalies of the present system, by which some articles are taxed, and other articles, almost similar in character, are allowed to go free; that he has convinced himself that these anomalies constitute a real grievance, and that he will do his best during the present session in one way or in another to relieve you from it. I can only say, gentlemen, in conclusion, that in this matter, and all others in which, I think I may add, we have a common interest, you may rely upon my best services being placed at your disposal. And now I ask you with all cordiality to drink the toast of 'Success to the Jewellers' Art.'"

Mr. J. W. Tonks responded. He was sure, he said, they would all be glad to hear of the possibility of something important in their interest being found in the next Budget. In their name he must thank the Right Hon. Mr. Chamberlain for his efforts in their behalf. He knew they were proud to have that gentleman not only as member for West Birmingham, but especially as member for the Birmingham Jewellers' Association. It was certainly gratifying to find such men favouring their endeavours to improve the jewellers' art, for the efforts of such men in their behalf would tend to remove the contemptuous regard some people had for artistic improvement. He hoped the achievements of the association in this direction would result in wealthy English people looking for their jewellery at home instead of going abroad, as many of them did persistently for specimens of great value and artistic merit. Having been appointed over the British class of jewellery exhibited at the Paris Exhibition, he had examined there some three hundred displays from all the European countries except Germany. The greater number of the purchases were made by British connoisseurs men of wealth and good taste, the British purchaser even surpassing his speculating American cousin in the number and value of his purchases. To those wealthy art lovers he would say, let the poor Englishman have a chance. In many trades designs were taken from foreign sources, France, Belgium, and Germany supplying the English in this particular, but the jewellery art of England was home-grown. Designs could be found, but what was wanted was the artistic and educated workman. They wanted that their workpeople should learn to feel the artistic instinct which enabled a man to give to his work that beauty of line and charm of proportion which gave the greatest grace and charm to a jewel. Mr. Chamberlain, while at Cairo, might have seen jewels worked by his own constituents, for the productions of Birmingham men went all over the world, but their art was yet young and they had much to learn. Mr. Chamberlain's remarks about technical education found an echo in their own minds, and they might regard the efforts in that direction as propitiatory.

Councillor Green proposed "Our Association." The association, he said, had existed two years. In looking through the report for the first year he was struck by the large amount of routine work which had to be done; but it had been done well. They must congratulate themselves on having had a fair rise of prices and remarkably few failures in the trade. Such failures as they had had were cases in which, with one exception, all had paid good dividends. That was from 5s. and 6s. to 20s. in the pound. The finances of the association were much better in the second year than the first, and though he contemplated great demands being made upon them, yet, with so many good friends as they had, he believed that good state of things would continue. In respect of the first object of their association, the purification of the practices of the trade from all fraudulent and reckless traders, they had already done good work. As to the second of their three objects—the prevention and detection of petty thefts—happily they had as honest and honourable a set of workpeople in Birmingham as could be found. Yet there had long been cunning devices practised to demoralise men, but the association had reason to be satisfied with its watchfulness over the prowling vagabond and thief-maker. As to the third object—the promotion of artistic education—he had looked into the schools being constructed, and he could testify to the earnestness with which the object was being carried forward.

The Chairman responded, and said the association during its short existence had saved £10,000 to the trade in legal expenses.

Mr. George Dixon, M.P., in proposing "Our City," said he thought they might all congratulate themselves upon being citizens of so important and so large a city. It had fallen to his lot to be connected mainly with the work of education in Birmingham during the last twenty years, and he could not help saying that he did not think there had been a greater, if an equal, development in any other direction than in that of education. He was gratified to know of the great development in education which the town owed to that association. The experience he had gained on the subject led him to the conclusion that it would be impossible for them to engage in a work of greater promise. Twenty years ago the average attendance at all the schools in the town was between 16,000 and 17,000. Now-a-days it was over 50,000, a far greater increase than the rate of the increase of the population meanwhile. In fact, now he might say that there were very few children not receiving some kind of education. If they would look at the Board schools and compare them with the old denominational schools they would find there was superiority in every direction—not merely in the buildings, not merely in the teachers, but he ventured to say also in the subjects taught. The old elementary schools no longer existed, and in place of the one middle school for boys twenty years ago, now they had seven schools doing precisely the same work, but, of course, for a much larger number of children. And instead of having a high school for boys only, they now had a high school for girls. Then they had Mason College. In fact, there was scarcely any step in the ladder of education about which they used to talk so much, not reached. Yet the Town Council had rightly considered there was one direction in which none of those schools could properly achieve what was desirable. That was in the direction of art. Therefore they had done what had been done in no other city in the country—they had undertaken the duty of providing for the town an art school, which had been one of the most successful institutions that had been created and grown up among them. And now he was happy to think, in consequence of the Technical Instruction Act passed last year, there was a hope that the City Council would provide for the town a technical school which should be as good in its line as the Art School had been in the direction of art. What would be wanting then in the education of the town to make it complete? It seemed as if the ground were entirely covered, but the more he thought of education, and the more he worked it out, the more vistas opened to him, and the more he became convinced that the more they did the more would seem to remain to be done. They were now giving education to all, but not giving as good an education as was possible, and they must never rest until they had done that. The first object they should have in view was that no child in the town should fail to receive such an education as would fit him or her for any future occupation in life the child might be called to. But there was another object, and that was that there should be no faculty in any child in the town for which they did not provide the means of its full and complete development—in the interests of society as well as in the interests of the child.

Mr. J. Powell Williams, M.P., responded, and drew a humorous comparison between the condition of Birmingham and the manners, customs, and costumes of the people 150 years ago, with the Birmingham and citizens of to-day.

Alderman Kenrick, M.P., proposed "Art and Culture," and spoke of the efforts of the association to provide art education as an augury of England becoming as renowned for its native art in jewellery as it was already renowned for certain classes of its paintings.

Alderman Sir Thomas Martineau responded, and called attention to the fact that in the Art Gallery there are exhibited some remarkable specimens of metal-working and some fine specimens of jewellery. No local artisan had yet visited the gallery with the intention of taking drawings of the designs, yet a German student had journeyed specially from Zurich for the purpose.

The proceedings, which were enlivened by good music, shortly afterwards closed.

The Duty on Silver Plate.—It is generally understood, says a London Correspondent, that the Chancellor of the Exchequer will this year remove the duty on silver plate, which only produces about £75,000, and may or may not have been the cause of crippling the silversmith's art in this country. At any rate, all efforts that have been made to revive the art have been so far wholly unsuccessful, although the Goldsmiths' Company has done its best to encourage competition and to stimulate taste in design by offering rich prizes. The difficulty hitherto in the way of a removal of the duty has been the necessary payment of something in the shape of a drawback on work already manufactured. But of recent years even the manufacture of silver spoons and forks has been so reduced that it is believed that something under £150,000 will satisfy all the claims for unsold stock which have been legitimately put forward by the manufacturers.

"Commercial London" is the title of a manual of business information for 1890, published by the Intercolonial Publishing Company, 131, Leadenhall Street, E.C, and edited by Mr. T. Simpson Jones. As stated in the dedication, the aims of the work are to increase business between British manufacturers and merchants and colonial importers. This it is eminently calculated to do, from the comprehensive information concerning all matters of trade interest it contains. The work may be summarised as a condensed directory from which all matters at issue in any way with the direct objects of its compilation are carefully eliminated, coupled with a compendium of information as comprehensive as that of Whitaker. All manufacturers doing an export trade should possess themselves of this manual.

Royal Observatory, Greenwich.

ANNUAL TRIAL OF CHRONOMETERS, 1889.—ORDER OF MERIT.

Order.	NAME.	No.	Trial No.	Order.	NAME.	No.	Trial No.
1	Kullberg	4739	9·1	24	Hume	2030	36·6
2	″	3782	15·1	25	Usher and Cole	6507	36·7
3	Isaac	1775	19·6	26	Hume	2033	37·6
4	Sewill	4516	21·2	27	Johannsen and Co.	3798	39·2
5	Mercer	4924	23·3	28	Blair	1888	40·0
6	Isaac	1785	25·0	29	Keys	984	41·5
7	Pyott	902	26·4	30	Glover	366	41·6
8	Nugent, Wells and Son	2858	27·7	31	Isaac	1687	42·5
9	Pyott	906	28·1	32	Sewill	4518	42·5
10	Johannsen and Co.	3851	28·8	33	Penlington	2517	44·6
11	″ ″	3872	29·2	34	Isaac	1789	45·5
12	Keys	978	30·2	35	Mercer	4824	47·1
13	R. and W. Sorley	$\frac{5}{3633}$	30·7	36	J. Poole and Co.	5812	52·6
14	Tainsh Brothers	$\frac{2}{5000}$	32·4	37	Glover	385	52·8
15	C. Frodsham	0018	32·8	38	C. Frodsham	0017	55·2
16	Kendal and Dent	4636	33·1	39	Kendal and Dent	1780	67·1
17	Edward and Sons	4936	33·5	40	Penlington	2520	79·2
18	Moore	1818	33·9	41	Schoof	6065	87·0
19	Kendal and Dent	4465	34·6	42	Hammersley	$\frac{1}{4008}$	87·3
20	Nugent, Wells and Son	2847	35·0	43	Buckney	4857	97·8
21	Whyte and Co.	4773	35·6	44	Hillgren	5	102·3
22	Moore	1811	36·3	45	Schoof	6059	146·0
23	Blair	1887	36·4		Johannsen and Co.	3794	Mainspring broken

ANNUAL TRIAL OF DECK WATCHES, 1889.—ORDER OF MERIT.

Order.	NAME.	No.	Trial No.	Order.	NAME.	No.	Trial No.
1	Ashley	3622	36·8	14	Brockbank and Atkins	215	85·1
2	Hall	3651	36·8	15	″ ″	213	96·9
3	C. Frodsham	07462	37·5	16	Buckney	30402	102·0
4	″	07586	41·3	17	Brockbank and Atkins	74212	106·9
5	Buckney	30399	45·5	18	Hall	2094	110·1
6	Ashley	3923	50·4	19	J. Poole and Co.	6424	118·1
7	Buckney	30202	56·7	20	Hammersley	$\frac{1}{4014}$	125·9
8	Isaac	10797	59·8	21	J. Poole and Co.	6498	127·4
9	Hammersley	$\frac{1}{4015}$	60·2	22	Buckney	30201	131·9
10	Dent	43637	63·1	23	Hall	3005	170·0
11	C. Frodsham	07587	72·0	24	Kendal and Dent	25450	198·1
12	Isaac	10825	72·4				
13	″	10795	75·6		C. Frodsham	07463	Mainspring broken

International Exhibition of Mining and Metallurgy, London, 1890.

AN International Exhibition of Mining and Metallurgy on an extensive scale, the result of a proposal which emanated from the *Mining Journal*, will take place in London during the summer of 1890, and arrangements have been made with the Crystal Palace Company whereby the exhibition will be held at the Crystal Palace, Sydenham. The scope of the exhibition will be sufficiently wide to enable a most valuable and interesting display to be made.

Immense advances have of late years taken place in mining and metallurgical practice, and no wholly suitable opportunity has presented itself, or been taken advantage of, for adequately illustrating the degree of progress which has been attained. This remark especially applies to metalliferous mining, and to the economical treatment of refractory ores for the recovery of precious metals. Moreover, it will be readily admitted that at no previous period has mining assumed such a degree of importance, whether it be regarded as an industry, a profession, or a vehicle for speculation and investment. A little consideration will suffice to emphasise the impression, which will doubtless have occurred to many, that an International Exhibition of Mining and Metallurgy, conducted on a sound and independent basis, is not only eminently desirable, but is admirably calculated to promote the best interests of legitimate mining and scientific metallurgy.

The space available for the purposes of the exhibition will admit of an extensive and representative display of articles, embraced within the scope of the prospectus, being brought together in one comprehensive collection. Every effort will be made to render the exhibition of real practical and educative service to those professionally engaged in the various branches of the mining and metallurgical industries, as well as to the general public, amongst whom so much uncertain knowledge exists regarding them.

The classification and disposition of the exhibits will receive careful attention, in order to facilitate their inspection by the public. Collections of mineral specimens, cases and samples of manufactured articles, samples of ores and minerals in bulk, models, machinery and mechanical appliances of a light character, maps and plans, etc., will be placed in the corridors and galleries devoted to the purposes of the exhibition; and the heavier machinery in motion, and the heavy exhibits generally, will be located in the spacious basement, and in the annexe to be specially erected for their accommodation at the north end of the Palace. Steam and gas-engine power will be supplied to exhibitors requiring them at moderate rates, based on the amount of power required, and on the position and individual exigencies of each exhibit.

The general charge for space, excepting in the annexe, and for a few special positions within the Palace, will be 2s. 6d. per square foot of floor-surface, and 1s. 6d. per square foot of wall-surface, with a minimum charge of £3 3s. for floor-space, and £1 10s. for wall-space. In the annexe the charge will be 5s. per square foot, with a mimimum charge of £5 5s. All applications for space from intending exhibitors in the United Kingdom must be made on the forms provided for the purpose, are subject to the rules and regulations of the exhibition printed on the back thereof, and must reach the hon. secretary at the offices, 18, Finch Lane, not later than March 15, 1890.

One-half of the surplus, as certified by the auditors, shall be paid to the exhibitors *pro rata* to the amount paid by them for space occupied, and the other half shall be disposed of by the council either in founding a scholarship at the Royal School of Mines, or in helping some other institution connected with mining and metallurgy.

The exhibition will open on July 2, and close on September 30, 1890.

The following summary, whilst not exhaustive, will serve to indicate the subjects embraced within the scope of the exhibition, and the range of exhibits admissible :—

Machinery in motion and at rest.—All kinds of motors, machinery and mechanical appliances used in connection with mining and the metal industries; hauling engines; winding gears; mechanical conveyors; stone breakers; ore crushers; stamp batteries; turbines; pumping machinery; utilisation of hydraulic power; machine tools, etc.

Gold mining.—The Welsh gold industry; the Indian, colonial, and foreign gold mining industries; modern systems of alluvial and quartz mining; hydraulicing; modern methods of extracting gold from refractory ores, etc., etc.

Silver mining, and the treatment of silver ores.

Diamond mining, and the diamond industry; diamond washing; the cutting, polishing, and setting of diamonds, etc., etc.

Iron-stone and iron-ore mining.—The Cleveland, Cumberland, etc., iron mining industries; iron mining abroad, etc.

The manufacture of iron and steel.—Blast furnace, foundry; rolling mill, and forge practice; the production of cast-steel castings; modern systems of iron and steel manufacture; the utilisation of blast furnace slag, etc.

Lead mining and manufacture at home and abroad.—The manufacture of white lead, etc.

Tin mining and smelting.—The Cornish tin industry; foreign sources of tin supply; the manufacture of tin-plates, etc., etc.

Copper mining, and the extraction and manufacture of copper.

Zinc mining and manufacture.

Coal mining.—Approved methods of coal mining, and machinery and appliances relative thereto. The manufacture of coke; the production of artificial fuel, briquettes, etc.; the production of coal gas, and the utilisation of the bye products.

The petroleum industry.—The foreign and colonial sources of petroleum; the production and transit of petroleum and oil fuels; shales; natural bitumen, etc.

Natural asphalt mining, and the utilisation of asphalt.

Mining for precious stones, such as rubies, garnets, sapphires, etc.; the cutting, polishing, and setting of precious stones.

The salt industry.—Salt mining; salt wells and pits; the production of salt for chemical, fishery, domestic, and other purposes, etc.

Mining for antimony, quicksilver, asbestos, arsenic, manganese, cobalt, platinum, bismuth, ochres, sulphur, uranium, and other minerals, and the subsequent treatment of the minerals and their products.

Alloys: their manufacture and utilisation.

The nitrate and phosphate interests.

Assaying, etc.

Chemicals, and the chemistry of mining and metallurgy.

Quarrying.—Granite, marble, paving flagstone, slate, limestone, etc., quarrying; granite, marble, etc., polishing; the rarer decorative minerals, etc.

Clays.—Fire clay, brick, tile, drain pipe, etc., manufacture. China clay, etc.

Cement.—Portland cement; utilisation of cements; concretes and artificial stones, etc.

Electricity in its application to mining and metallurgy; electrical haulage; the electric lighting of mines; electrical transmission of power; electrical extraction processes; telpherage, etc.

Explosives and their uses in mines and quarries; fuses; blasting, etc. *(Explosives may be shown in model and fac-simile only).*

The transport and shipment of minerals.

Scientific instruments used in mining and the metal trades; laboratory fittings, etc.

Collections of mineral specimens, and samples of coal, ores, and minerals in bulk.

Mining and metallurgical literature; maps; charts; photographs; plans of mines and mining concessions, statistical tables; mining journalism; educational and technical works; etc.

Mining tools and appliances.—Mechanical appliances and accessories of all kinds; miners' lamps; the ventilation of mines, etc., etc.

Ambulance practice, and the saving of life in mines.

The condition of working miners.

It is not the intention of the executive council to issue awards and medals indiscriminately. They will initiate special competitions of mining and allied machinery, and make special awards in these and other cases, as may be decided upon by any jurors who may be appointed.

It is also intended, if practicable, to establish a series of technical and popular lectures on subjects connected with the exhibition, and to hold a mining congress during the time the exhibition remains open. Several features of special attraction will be provided in connection with the exhibition.

The hon. secretary is Mr. Geo. A. Ferguson, editor of the *Mining Journal*, 18, Finch Lane, E.C., from whom prospectuses and application forms for space may be obtained.

"Art Metal" Clocks.

THE present fashion of decorating the drawing-room of our homes has caused a demand for a number of articles of manufacture that will assist in bringing about the required effect that may be aimed at by each individual householder. Manufacturers have not been slow to perceive this, and consequently, during the last ten years or so, we find ourselves confronted with an immense variety of wares designated "art work." The claims of some of them to this title are not very conspicuous, and we are in some danger of losing sight of the *bonâ fide* application of the word; this is in consequence, apparently, of some notion prevalent that the word "art" will help to sell the goods to which it is applied, whether they be artistic or not. On the other hand, the appellation comes (in some instances) peculiarly happy, and the so-called art metal clocks which are now coming to the front are an example of the proper use of the term.

The thoughtful observer will be able to judge of the goods offered for his inspection, and to do so with a considerable amount of accuracy, if he will ask himself a few questions mentally, as to what the requirements of an artistic drawing-room clock really are. In the first place, it should be rather small, or at any rate, as far as the dial is concerned—we do not want the hour of the day constantly staring us in the face in large figures in the drawing-room, the said room being intended as a place of quiet rest, the surroundings tasty and in accordance with the purpose for which the room is used. The mounting of the dial, or the frame, as it may be called, can be decorated, therefore, to suit the taste of the owner, and the general tone of the room; this gives some scope for the designer and art workman, and so we find combinations of *repoussé* and modelled work, of mosaic and hand-painted work, and other combinations that tend to earn the title claimed for them. In addition to this comes the most important item, it is *imperative* that the clock should be a good one; that is to say, that it should keep correct time. Perhaps our readers have never thought of the fact, that a clock which is standing still on any drawing-room or other bracket, as is too often the case with time-pieces, so called, is in that condition highly *inartistic*, as well as useless. It is so, because it upsets the harmony of the room by annoying the observer. It is imperative, therefore, that the mechanical part of the thing should be as good as possible, and this, I think, can be fairly claimed for all those made upon the interchangeable system used in the drum clocks which are now being mounted up in Birmingham. Another condition is essential to the owners of the small suburban villa of the present day, and who, as a class, are the great purchasers of these goods, and that is, that the price shall not be so great as to seriously affect or upset the state of the said owners' purses.

To find all these conditions fulfilled by one firm of manufacturers is the hope of the buyer, and I think the point has been achieved by one of our firms. I had the pleasure of inspecting some of the newest goods by one of our makers here a few days ago, and found a very happy state of affairs existing: good clocks, artistic mounts, small dials nicely ornamented.

One of the latest novelties was an arrangement of the Latin cross in plain gilt surface with the dial in centre, which has proved a great attraction for the Easter orders. Another very pretty arrangement consisted of an ivory-coloured xylonite mount with hand-painted flowers and foliage in their natural colours arranged round the border, the grouping and colouring being very good. Again, a xylonite frame with gilt *repoussé* ornament, consisting of flowers and scroll work, was very delicate and tasty; then, farther on, a variety of sporting designs, emblematic of cricket, fishing, tennis, football, etc., consisting of deposited and modelled work finished in an almost endless variety of styles of gilding, silvering, oxydizing, etc., and all finished with transparent lacquer to prevent tarnishing. Add to these a series of designs, beautifully produced by means of Florentine mosaic work, fitted into frames composed of crescent and star, double crescent, and other forms, and all the patterns made to stand up by means of a leg at the back, and I think we have a list that will be able to supply all tastes. In fact, the proof of this is not wanting in the report of the firm that their sales already amount to about one gross per week for home trade, and the shippers are just beginning to find that they are good lines also for them. The firms are so full of orders for these goods that they find it to be necessary to increase the number of their hands. The prices of the clocks range from 8s. 6d. each upwards to the wholesale trade, and this puts them within easy reach of all classes of buyers and commands a large sale. As new designs are being produced every week they are able to meet the requirements of all tastes, and the result is the employment of a large number of hands and a consequent amount of good to the community at large.

In conclusion, it is only fair to say that the firm referred to is Messrs. G. E. Walton and Co., Limited, Hylton Street, Birmingham, the well-known makers of watch keys, the name-key trade being a large speciality of theirs. The clocks used by them for mounting are specially made for the firm by the British United Clock Company, Birmingham, and are thoroughly reliable goers.

A. Osborne.

Sale of Fine Old English Plate.

THE collection formed by Sir Frederick Milbank, sold on February 27 by Messrs. Christie, Manson, and Woods, contained some remarkable examples, and attracted a very full room, bringing extraordinary prices. The sale began with the seal top spoons of silver of the 16th and 17th centuries. Two spoons, one of 1560, the other of 1562, sold for £15 15s. (Gooden); two seal tops, 1573 and 1577—£14 6s. (Boore); two, 1578 and 1595, £14 14s. (Boore); two, 1610 and 1613—£15 15s. (Boore); four, dated 1616, 1617, 1620, 1629—£27 6s. (Boore); four, dated 1631, 1632, 1639, 1648—£27 6s. (Boore); four, dated 1633—£33; three old English spoons, dated 1581, 1607, 1632—£13 13s. (Conrath); a spoon, seal top, Norwich hall-mark, date 1637, and one with date mark 1617—£13 13s. (Hawes); old English spoon with straight handle and curious hall-mark—£13 13s. Of the apostle spoons, so called from having the figure of an apostle at the top of the handle, all of silver, one dated 1564, with one of 1578, sold for £24 (Boore); two, one dated 1587, the other 1601—£23 (Conrath); two, dated 1607—£27 (Boore); three, dated 1620—£21 10s. (Dobson); two, one dated 1645, the other plain—£25 (Wells). The various pieces of silver table-plate sold at high prices, from 10s. to 30s. per oz., some going for much higher prices, as, for example, a porringer at 70s. per oz.; a pair of snuffers at 71s. per oz.; a cream jug, formed as a shell, chased with flowers, the handle as a branch, on foot formed as a snake, the work of Paul Lamerie, at 201s. per oz., weight 6oz. 2dwt.; a Monteith, engraved with Chinese figures, date 1684, at 95s. per oz., 36oz.; a small chalice of silver, with band of ornament and chased stem, date 1587, at 124s. per oz., weight 3oz. 19dwt. A large two-handled silver cup and cover, embossed with foliage, the knob formed as a cluster of foliage, the handles as terminal female busts, date 1686, and weighing 32oz. 3dwt.—this sold at 207s. per oz., the piece coming to over £330 (Willson); a plain two-handled cup and cover, engraved with shield and arms, date 1663, at 91s. per oz., weight 14oz. (Phillips).

A set of four silver salt-cellars of the 16th century, quite plain, but described in the catalogue as "matchless." These were the set of four which belonged to the Society of Serjeants' Inn, and were known as the "Old Salts" at the time of the Fire of London in 1666. The fifth was a "top salt," which was bought by Mrs. Abbot Lawrence, and is now in the United States, having been sold in the collection of Sir George Dasent in 1875. They are marked with the lion passant, but the London hall-mark has been obliterated through the constant cleaning. They weigh 33oz. 19dwt., and measure 5½in. across the top, the foot being rather smaller, with a contraction in the centre. They sold at 87s. per ounce, or a little over £138, and something less than they brought in Sir George Dasent's sale.

The Blacksmiths' Cup, which formerly belonged to the Blacksmiths' Company, was a tall cup of silver, 11½in. high, without a cover, the bowl engraved with the arms of the Blacksmiths' Company, and decorated with tooled granulated ornament, the stem formed as a figure of Vulcan standing by his anvil, on which is engraved the motto, "By hammer and hand all arts doe stand," and round the brim inscribed, "The gift of Christopher Pym, upon his admission to the place of Clerk of this Company"; the hall-mark upon it is of 1655. This cup was in the famous collection of Mr. Ralph Bernal, and passed into that of Mr. Dexter, and is described and engraved in Cripps's "Old English Plate." It weighs 30oz. 4dwt. This was not sold at per ounce, and brought £535. When sold in the Bernal collection in 1855 it was bought for £37 10s. by General Lygon, who sold it to Mr. Dexter for £25, but in Mr. Dexter's sale in 1872 it sold for £367 10s.

A silver box and cover, as a scallop shell, chased and fluted, with shells on the foot, date mark 1630, weight 7oz. 6dwt.—at 176s. per oz. (Garrard); another, larger, similar—at 199s. per oz.; 12 rat-tailed spoons, silver gilt, time of Queen Anne—at 50s. per. oz.; others of various dates, silver gilt, at about the same price; a tankard formed of lava, mounted with bands of silver, the cover engraved—£120 (Heigham); a German drinking cup, with curious designs and a bell attached, 12in. high, having no foot—£120 (Boore); six small rat-tailed spoons of solid gold—at 258s. per oz.—weight 5oz. 11dwt., with six forks to match.

After the Milbank collection had been sold, there was offered as the property of a gentleman an Elizabethan baronial salt-cellar and cover, of silver, cylindrical in form, the centre beautifully chased with lions' masks in shields, flowers and bosses in flat bands, the foot and border chased with fruits and bands, the lid similar and surmounted with a three-handled vase supporting a man in armour holding a spear and shield, on three feet formed as heads of animals. The salt-cellar and cover bear the Exeter hall-mark and maker's name, Eston, with the letter G. It is 8½in. high by 3½in. wide, weighing 9oz. 10dwt. This beautiful little piece was received with a round of applause, followed by a bid of 200 guineas, immediately met with one of 400, then 500, and afterwards by fifties it rose to 600, when, after advancing by tens, the biddings stopped at £670, and the hammer fell; but though the applause was again enthusiastic no name of a buyer was given, so that it is presumable it did not reach the reserve price.

From another property were sold a pair of flat-shaped silver gilt cups and covers, finely chased, the covers surmounted with pomegranates, German work, 1695, from Burghley House—£135 (C. Davis); a fine oval silver gilt two-handled dish, with open-work border, and the centre with Lot and his daughters in relief, hall-mark 1673—£365 (C. Davis).

Fanmakers' Company.—The third competitive examination of fans, fan leaves, and fan sticks, and designs for the same will be held by the Company of Fanmakers at Drapers' Hall in May next. Prizes are offered to the value of £250, divided under classes from A to H. Particulars and rules for the competition can be obtained from the clerk of the company, Guildhall, E. C.

Board of Trade Returns.

THE clocks and parts thereof imported during February reached the value of £35,695, in comparison with £32,042 for the same month of last year, and £35,637 for February, 1888. The following shows the sources of the supply:—

	1888.	1889.	1890.
From France	£14,496	£11,190	£13,624
„ United States ...	£8,118	£6,651	£5,776
„ other countries ...	£13,023	£14,201	£16,295

The first two months of this year give a total value of clocks imported of £66,184 against £59,292 in the same two months of last year, and £66,150.

The watches and parts thereof imported in February valued £50,596. In the same month of last year it was £60,370, and in the February of 1888 £28,863. The two months of this year give a record of £88,481, in comparison with £105,496 for the same months of last year, and £76,062 for those of 1888.

The plate and plated and gilt wares exported during February are estimated at £27,278, in comparison with £28,261 for the same month of last year, and £25,086 for that of 1888. The two months of this year show a value of £56,316, against £55,322 in the same period of last year, and £49,918 in the same month of 1888.

The imports of all kinds of produce for February were £41,018,842. The same month of last year gave a total of £32,340,096, and that of 1888 £29,557,557. The total for the two months of this year is £69,162,692, in comparison with £70,398,414 for the same period of last year, and £64,384,809 for that of 1888.

The value of exports of British and Irish produce in February was £21,084,228. The same month of last year gave a record of £18,670,352, and February, 1888, £19,035,961. The exports for the two months of this year have reached the value of £42,670,980, against £39,197,389 for the same months of last year, and £37,658,455 for the same period of 1888.

Practical Vision-Testing.

By R. Brudenell Carter, F.R.C.S.

A Paper read before the Society of Arts.

(Continued from page 224).

A TEST of colour vision should be independent of naming the colours; it should be sufficiently exhaustive to preclude the possibility of evasion by chance or guessing, and should be sufficiently rapid to permit of large numbers of persons being examined in as short a space of time as possible; these requirements are fulfilled by Holmgren's coloured wools.

The test consists of three parts; the first enables us to discover the existence of defective colour vision, the second to detect its nature, while the third is merely confirmatory.

In the first stage the examinee is given a test colour, a skein of a rather pale green, a grass-green much diluted, and there are spread out upon a white cloth, in a good light, a number of other skeins, consisting of all shades of green, as well as greys, drabs, pinks, and yellows, all considerably diluted with white; the examinee is then told to pick out from the heap those skeins which appear to him to be of the same colour as the one held by him, but without regard to differences of shades. If he chooses all the greens and no other colours, he has normal colour-vision; if this is defective, he will choose one or more of the "confusion colours," and he must be put through the second test.

In this the test colour is a dilute purple or rose colour; as it is composed of red and violet, the red-blind matches it with blue and violet. For the green-blind a combination of red and violet produces grey, and green has a similar effect; hence he chooses these confusion colours. If the examinee fails in the first test, but succeeds in the second, he has a weak colour sense, but is not totally blind to one of the fundamental colours.

In the third test a bright red, such as is used in signal flags on railways, is the test colour ; the red-blind matches it with dark green and dark brown, the green-blind with brighter shades of these colours.

It will be observed that, in the foregoing description, the test is only to be applied in a "good light," or, as I should prefer to put it, only in full daylight without direct sunshine, as at a window with a north aspect ; and that the skeins to be selected from are to be spread out upon a white cloth. Not one word is to be said as to the names of colours ; and the only point to be determined is whether the examinee can see with certainty, or is more or less doubtful about, differences which to normal eyes are of the most conspicuous character, leaving absolutely no possibility for mistake between them. If, as between light green and light drab, the railway or marine candidate hesitates for a single moment, or makes any attempt even to compare them, he is not to be trusted to distinguish colours in all the varied circumstances in which they are liable to be brought before him in the course of duty. If he selects rapidly, and makes no mistakes, it is not conceivable that he should make them in any circumstances. Green and red will be to him distinct sensations, which it would be no more possible for him to confuse than it would be possible to confuse the taste of salt with that of sugar. In other words, he has a correct colour-sense, and it would be simply impossible for him to fall into any error on the question. If any colours other than greens are selected by the examinee, he is next given a shade of light purple to take as a standard in a similar way, and the nature of the errors which he makes in finding matches for this will show whether his colour-blindness is for red or for green. Although violet blindness exists, it is so rare, and so unimportant as regards industries, that it may be neglected. A third test of the nature of the colour blindness is furnished by endeavours to match a red skein, but this is only confirmatory of the results previously obtained.

Holmgren's test, carried out in rigid conformity to his instructions, has now been applied by skilled observers to young and adult males in almost every civilised country ; and Dr. Joy Jeffries, in the last edition of his work upon the subject, tabulates the results of the examinations of 175,127 persons, conducted in the manner indicated. Among this number the per-centage of those with colour-blindness amounted to 3·95, and it is hence a fair conclusion that any method of examination which gives a per-centage differing from this in any marked degree must be vitiated by some error, either in its own nature or in the method of carrying it into effect.

The methods pursued on the English and Scottish lines of railway, and also by the Board of Trade, have, as far as I am acquainted with them, one feature in common, which is that they are all wrong, the direct offspring, in almost every instance, of a degree of ignorance and presumption the very existence of which would be incredible, if the proofs of it were not brought daily under our observation. Even where the use of Holmgren's method is professed, the rules laid down by Holmgren for conducting it are, as a rule, utterly ignored, and the results obtained are as utterly misleading. The test should be used in exact conformity with his very detailed and precise instructions, or it should not be used at all.

When properly applied, Holmgren's test may reveal one of several conditions. Normal colour-sense is to be expected from 96 per cent. of the examinees, and among the rest there will be found complete red-blindness, complete green-blindness, incomplete red or green blindness, and a condition which may be described as a feeble colour-sense. All these can be distinguished apart with certainty, and they have been found in a sufficient number of instances to warrant the conclusion that the incomplete forms of colour-blindness vary in degree, and pass into normal colour-sense by imperceptible gradations. It therefore becomes necessary, just as in the case of defective form vision, to possess some means of measuring the defect of colour-sense, and of deciding whether or not it is sufficient to exclude the subject of it from the occupation in which it is his desire to engage. Considering that defective colour-sense affects only 4 per cent. of males, to whom many other occupations are open, I do not myself recognise any hardship in excluding the whole of them from the railway or marine services ; and I would not, in either, accept a man who even for a moment hesitated whether or not to place a drab as a match for a green. The question, however, is one for employers to decide, more especially when it refers to retaining or dismissing a man already in the service ; and hence various means have been devised of measuring the degree of colour defect, and of expressing it by a fraction, as is done with form vision. In order to effect this, Professor Holmgren has employed an arrangement by which a shadow is illuminated by coloured lights, and Professor Donders has employed small discs of colour, measuring the distances at which they are recognised, and also a lantern, fitted with interchangeable coloured glasses and with a revolving disc perforated with apertures of different diameters, the very contrivance, in short, which Mr. St. Clair Buxton has professed to invent within the last few months, and which was most fully described in Graefe's "Archiv fur Ophthalmologie" thirteen years ago, before the most recent inventor of it became a member of the medical profession. Perhaps the best form of this contrivance is that which has been long in use on the Belgian State Railways. It consists of a lantern, before which glass of any desired colour can be placed ; while in front of the glass there is a metal screen, with a central opening filled by what is called an iris diaphragm ; that is, a mechanical arrangement by which the size of the aperture can be diminished or increased at will, with very slight departure from its circular outline. The examinee is placed opposite the lantern, and is directed to look towards it, and to call out "Stop" or "Go" as soon as he recognises a signal to justify either. The coloured glass being in position, the iris diaphragm is opened to such an extent as to represent a signal lamp at the farthest distance at which it would be visible. If the examinee is silent, the opening of the diaphragm is enlarged at such a rate as to represent the steadily-increasing visibility of a signal towards which an engine was running at the rate of thirty miles an hour. As soon as the examinee speaks, the enlargement is stopped, and the magnitude of the opening affords a precise measure of the acuteness of his colour-sense. Such contrivances as these, as all who are conversant with the subject have pointed out, are of no value, or at least are unnecessarily troublesome and cumbrous, for original testing, and are only useful in the conduct of the secondary examinations which may sometimes be required in order to prevent the possibility of injustice.

The outcry which has recently been made in certain journals which profess to have the interests of railway men at heart, has been a mere reproduction of the similar outcry, already mentioned, which arose some few years ago in the United States, and which was there speedily silenced by the influence and by the demonstrations of men of science, among whom the chief place must be given to Dr. Joy Jeffries, of Boston, who has himself carried out more than 34,000 examinations, and who has been mainly instrumental in rendering such examinations, properly conducted, obligatory in many, if not in all, of the States of the Union. The chief characteristic of the outcry, as we have lately heard it, is that those by whom it was conducted appear to have been illuminated, as regards the principles at issue, solely by the light of nature, and to have been absolutely ignorant alike of optics, of physiology, of previous research, of the weight which should attach to those by whom this research has been conducted, and sometimes of the meanings of the words they have employed. It is, perhaps, not surprising that Mr. Clement Stretton, who, I understand, is an engineer, should believe Professor Holmgren to be a German, or should entirely misdescribe his test, or should say that the "highest scientific authorities" (who are they ?) differ as to its proper application ; but it is melancholy, and to me humiliating, to find members of my own profession lending their support to all this utter nonsense. I read somewhere, and have vainly endeavoured to find again, a denunciation of the "fallacies of the Young-Helmholtz theory." I believe the writer of this delightful sentence had never even heard of Thomas

Young, and that he had before his consciousness the idea of Helmholtz junior. Professor Helmholtz is probably the greatest of living physicists, and much of his life has been devoted to the study of the phenomena of light and colour, with the result that he thought the views of Young might be susceptible of some modification. But what shall I say of Young, the greatest philosopher (if we perhaps except Newton, one of whose only two important errors he corrected) that the world has ever produced, and, moreover, the philosopher who laid the foundation of all we know about either light or colour, by the establishment of the undulatory theory? Perhaps I may best do justice to his memory by quotations. Tyndall says of him :—"In the year 1773 was born, at Milverton, in Somersetshire, one of the most remarkable men that England ever produced. He was educated for the profession of a physician, but was too strong to be tied down to professional routine." I am proud to interpolate that he was physician to St George's Hospital. "He devoted himself to the study of natural philosophy, and became, in all its departments, a master. He was also a master of letters. Languages, ancient and modern, were housed within his brain ; and, to quote the words of his epitaph, 'he first penetrated the obscurity which had veiled for ages the hieroglyphics of Egypt.' It fell to the lot of this man to discover facts in optics which Newton's theory was incompetent to explain, and his mind roamed in search of a sufficient theory. He had made himself acquainted with all the phenomena of wave-motion, with all the phenomena of sound, working successfully in this domain as an original discoverer. Thus informed and disciplined, he was prepared to detect any resemblance which might reveal itself between the phenomena of light and those of wave motion. Such resemblance he did detect, and, spurred on by the discovery, he pursued his speculations and his experiments, until he finally succeeded in placing on an immovable basis the undulatory theory of light."

Helmholtz himself, whom Tyndall describes as being of "kindred genius" to Young, thus speaks of him :—"His was one of the most profound minds that the world has ever seen, but he had the misfortune to be too much in advance of his age. He excited the wonder of his contemporaries, who, however, were unable to follow him to the heights at which his daring intellect was accustomed to soar. His most important ideas lay, therefore, buried and forgotten in the folios of the Royal Society, until a new generation gradually and painfully made the same discoveries, and proved the exactness of his assertions and the truth of his demonstrations."

One word may, perhaps, be given to Mr. Stretton's "German," Holmgren, the illustrious professor at Upsula, to whom is due the great credit of having first strongly directed attention to the frequency and importance of colour-blindness, and whose numerous writings upon the question show that he has for many years made it a subject of laborious research in every possible manner, with tests of every description, with every experiment which ingenuity could devise or skill could execute. There is no possible use of the spectrum, of coloured glasses, or of coloured objects of every kind which Holmgren has not exhausted, and those who have not made acquaintance with his works will act most discreetly if they keep silence on the matter. It is too ludicrous to hear the doctrines of Young and Helmholtz, and the enormous practical experience guided by the encyclopædic knowledge of Holmgren, set at naught by two or three gentlemen of an age at which modesty is an adornment, whose acquaintance with the subject is derived from having made a score of people look through bits of coloured glass at a light, and who are capable of writing about "the fallacies of a theory." Perhaps I may illustrate the value of their opinions on two points, not having time to deal with more. One of them thinks his procedure likely to be specially valuable in cases of central scotoma for colour, a condition which he says exists ; that is, a state in which there is colour-blindness in the centre of the field of vision, and right colour sense over a ring around this centre. Over the other parts of the field, colour-blindness is a normal condition. Now, as far as I am aware, and I have been surgeon to an eye hospital for more than thirty years, there is no such thing as central scotoma for colour except as a consequence of disease which produces also imperfection of vision for form ; and the latter alone, without deficiency of colour sense, would constitute a sufficient disqualification. Another of our new lights professes to find, in a book mainly written by Mr. Juler, the assertion that "all colours if sufficiently illuminated appear white," and on this he suggests that fatigue of the retina would be likely to produce the same effect. Now, fatigue of the retina diminishes its sensitiveness, and would, therefore, assimilate a strong light to a weak one. In addition to this, our mentor does not appear to have read the whole of the chapter to which he refers, or he would see that, although appearing in Mr. Juler's book, it was written by Mr. Frost, to whom he ought to have given credit for it. Moveover, the passage referred to does not bear the interpretation put upon it, and could not mislead anyone who possessed even a smattering of physical optics. It refers, perhaps, something less clearly than would have been possible, to the fact that the light reflected from the absolute surface of a coloured body is white, that only being coloured which has penetrated a little way into the substance, and has then been reflected from molecules beneath the surface. Hence, if the observer is so placed as to receive chiefly the rays reflected from the absolute surface, a coloured body may appear white. The question is not one of sensation, but of the character of the light which the eye actually receives, and it does not afford a shadow of support to the utterly absurd conclusion which has been attempted to be founded on it.

I am compelled by time to draw to a conclusion. It would be impossible to do justice to the subject except in a series of lectures, with an abundance of experiments ; and no one can be more conscious than I am of how much I have been compelled to leave unsaid. I will make only a brief reference to the complaint that railway men are tested capriciously, concerning which I would say that such a course, if it be pursued, is clearly wrong. A candidate for employment should be tested both for form and for colour-vision, before he is engaged ; and he should be tested for both by an expert, according to the dictates of true science, as distinguished from sham science on the one hand and from the ignorant presumption of the inventors of so-called practical methods on the other. After any accident, or any severe illness, he should be tested for form-vision again, and he should also be tested again, if he were originally what is called hypermetropic, that is, if his eyes were flat, at about forty or forty-five years of age. The test for colour-vision need not be repeated, because if this faculty should be affected by disease or injury form-vision would also be affected, and in a sufficient degree to disqualify the person. Against a condition in which form and colour-vision may both gradually fail, as a consequence of deep-seated disease of the nervous system, no safety is practically attainable ; but the risk incurred in this direction is inconsiderable, because such disease would soon declare itself by other symptoms. I will only add that anyone who wishes to understand the subject will be greatly helped by a careful study of the work of Dr. Joy Jeffries, of Boston, United States, on "Colour Blindness, its Dangers and Detection." If those who have taken part in the recent controversy had only mastered even as much of the question as is given in this book, there would have been a great saving of fruitless inkshed, as well as of time which might have been better employed.

The sale of Sir Frederick Milbank's old plate, of which *Truth's* correspondent gave an account some time ago, is said to have excited a mighty fuss in the North Riding, for it seems that among the lots was the ancient silver chalice which belonged to Hutton Magna Church. It appears that twelve years ago, when this church was being restored, Sir Frederick was given the chalice in exchange for a new set of vessels for the Holy Communion. The committee, who were responsible for this quite illegal transaction, knew nothing of the real value and fine character of the chalice, which had been in the church since the Reformation. The Bishop of Ripon is to be urged to take steps to obtain its restoration, for the committee clearly acted *ultra vires* in parting with it. Sir Frederick Milbank was not to blame, for he cannot have known that the whole transaction was entirely irregular.

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

CONTINUING his series of articles on the above-named subject in the *Jewelers' Circular*, Dr. Bucklin says myopia exists when the retina is located behind the focus of the dioptric system, the eye being in a state of perfect rest. How the retina becomes thus located has been accounted for in a variety of ways. It has been claimed that the cornea has a more sharply-curved spherical surface in myopic individuals than in those individuals who are not myopic. Again, it has been claimed that the lens has in myopic persons sharper spherical curved surfaces than that of the emmetropic eye, while the latest and most generally accepted cause of myopia depends simply upon an increase in the diameter of the globe by means of its being stretched.

While in certain cases a diseased condition of the cornea allows it to bulge or become conical, thus producing corneal conditions sufficiently active to produce myopia, still careful investigation of the curves of the normal cornea with the ophthalmometer fail to demonstrate that the cornea is more sharply curved in myopia than in emmetropia.

It is also true that the lens under certain pathological conditions also accounts for myopia; this is demonstrated by the peculiarity which appears during the development of cataract, called "second sight." The lens during its stage of swelling frequently becomes so strong that the individual who formerly wore convex fourteen lenses to read with can dispense with them for reading, and may even require concave lenses for distant vision. With the above-mentioned exceptions, the universal cause of the myopia appears to be a stretching of the eye-ball.

It has been stated that the myopia is in many cases directly inherited. I cannot reject this statement about those *exceptional* cases where myopia of ½ is found during the second or third year of life, but, as a rule, the tendencies which lead to the development of myopia are inherited and not the defect direct. In hyperopia the entire defect is directly inherited, and the hyperopia is as great at birth as at any subsequent date till the age of forty-five. In myopia the conditions are quite different—the child inherits a soft condition of the coatings of the eye. This is also disputed by some, who claim that any young eye from injurious influences may become myopic. The inherited soft condition of the eye is, however, the only explanation which will stand the light of investigation for a single minute. If you observe a myopic child it is safe to conclude that it has a myopic parent or grandparent. I made this remark to an old optician several years ago who brought his daughter to me to be examined. He told me that he had fitted glasses for his wife, her parents and his parents, and had also fitted himself with glasses. He assured me that no person in the family but the daughter was myopic. I turned to him and requested him to read the distant letters his daughter was having so much trouble to read. It was demonstrated in a moment that he was more myopic than the daughter he had brought to me; thus it will be seen that the opinions of parents who contradict the statement that myopia has been inherited must be taken with due allowance.

I give as an example a family reported by Mauthner. Father and mother had myopia of ½. Of thirteen children, nine females and four males, there are nine (six females and three males) who are myopic in both eyes. One female is myopic in one eye and emmetropic in the other. There are only three (two females and one male) who are emmetropic in both eyes, and they have unusually acute vision. Many similar examples could be given from my personal experience, but one is sufficient to illustrate the point.

The inheritance of myopia has very many peculiar things about it; for example, an emmetropic daughter of a myopic family marries an emmetropic man. From the marriage there were four children, three of whom were myopic, two developing myopia of a very high degree. It also sometimes happens that all of one sex in a family inherit myopia. In families where both parents are myopic the myopia of the children is greater than the highest degree on either side, and the degree of myopia is frequently equal to or greater than the combined myopia of both parents. Exceptions, however, of emmetropic children under these conditions are occasionally observed. When one parent is emmetropic and the other myopic, the degree of myopia developed in the children is likely to be less.

The results of marriages between myopic and hyperopic persons upon the eyes of the resulting children has been left entirely in the dark. I cannot find any literature or material from which to form an opinion. I hope that some of my readers will in time furnish me with the facts showing the effects upon the eyes of children, the parents of whom are on the one side highly hyperopic and on the other highly myopic.

I think from the above my readers will feel convinced that the influences which determine that an individual will become myopic are inherited influences.

Our correspondence requiring answers is so extensive, that we will leave the subject of myopia at this point and consider the further factors in its etiology in our next issue.

The following series of questions submitted to the editor of our contemporary by various correspondents and their answers by Dr. Bucklin will be read with interest:—

1.—I have a difficulty with my eyes which gives me a great deal of annoyance, and I would like you to tell me what the trouble is with them.

I have read your articles in *The Jewelers' Circular*, and "Detection and Correction of Visual Imperfection," with a great deal of interest, but can find nothing that gives me any insight into it unless it be muscular asthenopia. I have quite a high degree of myopia: wear No 6 glasses. The difficulty that annoys me is, I see double. That is, the object that is between myself and the object I am looking at. For example, I look at a pole ten rods distant and there is another pole five rods distant, in or nearly in a line with the farther one. I can see the nearer one dimly double. I close my right eye and the one at the left disappears. I close the left eye, the right one disappears. Is same with or without glasses on. I cannot read long at a time by lamp-light. The letters after a time all run together and my eyes pain me. By closing one eye the other does not pain me and I can read.

I am a watch repairer, and sometimes wear my glasses while at work, but nearly always take them off while at very close work. What can I do to help my eyes? Do you think it injurious to work at my trade? "Double."

Answer 1.—The above-described individual has slight divergent strabismus as a result of his high degree of myopia. Divergent strabismus in highly myopic persons with double vision is a common difficulty. Double vision during distant vision can only exist as a result of strabismus.

Strabismus as a result of a paralysed ocular muscle or as a result of high degrees of myopia, is the only form of strabismus in which double vision exists. The internal recti muscles must be the weak ones, because when he closes the *right* eye the left image disappears, and when he closes the *left* eye the right image disappears.

The above statement demonstrates the existence of crossed diplopia, and this defect can only exist as a result of defective internal recti muscles. At the reading distance he has the annoyance in that exaggerated degree which is experienced in muscular asthenopia resulting from high degrees of myopia.

Any occupation which will pay as well which does not require fine work at a close distance is better for eyes of this description than watch repairing.

If muscular asthenopia for the working distance was the only difficulty complained of, the means of relieving the difficulty would be very simple. Diplopia existing during distant vision complicates this very much.

The optical means at our command for the relief of such a difficulty are as follows: Remove the point of fixation for the working distance to the most comfortable distance by weak concave lenses. Correct the remaining difficulties of fixation by the use of prisms base in. Owing to the extensive failure of the internal muscles to perform their usual functions, as is indicated by the existence of diverging strabismus during distant vision, it is highly probable that the prisms required would be very strong and would consequently produce annoying symptoms. Simple tenotomy of the external recti muscles which would cause the double vision to disappear, would probably place the person in such a condition that satisfactory glasses could be obtained.

Myopic persons who have annoying symptoms at the working distance furnish the most difficult class of cases which the optician has to deal with.

(To be continued.)

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

2,772. E. L. Mayer and J. G. Lorrain, London, for "Improvements in, or connected with, the separation and recovery of gold and the treatment of ores or other matters containing gold, or with which gold is combined or associated." Dated February 20, 1890.

2,856. R. Bragge, Birmingham, for "Improvements in chromo-micrometer watches." Dated February 22, 1890.

2,937. V. Milward, London, for "Improvements in necklaces, bracelets, anklets, waistbands, and other like articles and ornamental fringes." Dated February 24, 1890.

3,045. C. Brown, London, for "Improved safety attachment for preventing the withdrawal of watches or other articles from the pocket." Dated February 26, 1890.

3,161. E. Edwards, a communication from J. Pallweber, Germany, for "Improvements in clocks." Dated February 27, 1890.

3,183. H. Allsop, Birmingham, for "Improvements in the manufacture of bracelets, scarf-slides, and such-like articles." Dated February 28, 1890.

3,226. W. Barr, jun., and D. McKay, Glasgow, for "Improvements in and relating to jewellery." Dated February 28, 1890.

3,238. J. A. Fincher, London, for "Improvements in sleeve-links." Dated February 28, 1890.

3,337. J. W. Mason, Edinburgh, for "An improved method of showing universal time or world time by a machine called a map clock, or world clock, or universal clock, or new hour map of all the globe with clock-work thereto." Dated March 3, 1890.

3,484. E. Schweizer, London, for "Improved electrical secondary clockwork" (complete specification). Dated March 4, 1890.

3,658. J. Steinheuer, London, for "Improved electrical signal clock" (complete specification). Dated March 7, 1890.

3,802. M. J. Jaensch, Isle of Bute, for "A new kind of pin to be called Jaensch's cuff pin." Dated March 11, 1890.

3,933. G. Symonds, Birmingham, for "Improvements in cards for displaying jewellery, fancy articles, and for like purposes." Dated March 13, 1890.

Recent American Patents.

Earring. H. Rees.	421,433
Spectacle Case. F. Shailer	421,438
Bracelet. W. Riker	421,615
Clock Escapement. M. Schwalbach	421,622
Screw Cutting Die. T. L. Smith	421,773
Ruby Pin Setter. L. W. Greb	421,831
Spectacle Frame. W. X. Stevens	421,779
Repeating Mechanism. F. Terstegen	421,844
Refracting Lens. W. Kochs	421,505
Fountain Pen. A. Reid	421,614
Cuff Holder. E. C. Townsend	421,637
Handle for Coffee Pots. G. F. Batsford	421,807
Calendar Clock. E. B. Miller	422,090
Safety Catch for Jewellery. H. Sesslar	421,981
Shield for Spectacle Frames. H. M. Wilson	422,001
Necktie Fastener. H. Beichling	422,283
Polishing Apparatus. N. Peloquin	422,246
Device for Testing Watch Balances. W. D. Olney	422,616
Compound Ingot—Wire made therefrom. L. L. Burdon	422,713
Button. S. R. Grover	422,882
Making Seamless Plated Hollow Wire. H. T. Smith	422,647
Button. C. H. Peck	422,890
Fountain Pen. O. F. Weidlich	422,474
Lead Pencil Sharpener. A. Ames	422,485
Electric Time Alarm. N. H. Suren	422,654
Buckle. R. J. Dearboun	422,741
Snap Hook. J. Kennedy (Birmingham)	422,801

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

Kent.

Mudon, E. S. (trading as John Mudon), 46, Kirkdale, Sydenham, jeweller and watchmaker. Trustee, Frank Fletcher, Chiswell House, Finsbury Pavement, E.C., and Leeds, I.A. Unsecured Liabilities, £287 15s. 9d. Estimated Net Assets, £123 3s. 1d. Deed of Composition dated March 12, 1890; filed March 14, 1890.

Creditors.		£	s.	d.
Cooper, H. J. and Co.	London	20	0	0
Eaborn and Honor	"	13	10	10
Jeanot, Paul	"	30	10	10
Gallancy, Alexander	"	17	15	5
Paulig, F.	"	50	0	0
Walton, Jos.	"	21	7	0

Darley, Frederick Henry, 5, Church Street, Folkestone, watchmaker and electrician. Trustee, A. E. Watts, Grace Hill Chambers, Folkestone, solicitor. Unsecured Liabilities, £552 14s. 8d. Estimated Net Assets, £200. Deed of Composition dated March 11, 1890; filed March 13, 1890.

Creditors.		£	s.	d.
Cooper, Thos.	Liverpool	340	0	0
Turnbull Bros.	Birmingham	72	18	10
Little, James, and Co.	London	17	7	0
Committee of Folkestone Exhibition Guarantee Fund		50	0	0

(And 23 under £10.)

Warwick.

Scott, Morris, 39, Frederick Street, Birmingham, jeweller. Trustee, John Wilkinson, 40, Bennett's Hill, Birmingham, C.A. Unsecured Liabilities, £414 19s. Estimated Net Assets, £520. Deed of Composition dated March 6, 1890; filed March 12, 1890.

Creditors.		£	s.	d.
Roek and Co.	London	40	0	0
Scott, H.	"	13	0	0
Allday, J., and Son	Birmingham	15	0	0
Cox Bros.	"	15	0	0
Cox, W. F.	"	19	0	0
Rolason Bros.	"	12	0	0
Venour, F.	"	43	0	0
Hayward, J.	"	16	0	0
Shuker, A.	"	12	0	0
Richardson, J.	Coventry	29	0	0
Breatez, A., and Co.	Switzerland	18	0	0

Hants.

Parkin, Edward Arthur, The Arcade, Landport, jeweller and watchmaker. Trustee, Albert L. Honey, 1, Post Office Street, Exeter, accountant. Unsecured Liabilities, £462 9s. 1d. Estimated Net Assets, £338 13s. Creditors fully secured, £100. Deed of Composition dated March 1, 1890; filed March 8, 1890.

Creditors.		£	s.	d.
Hirsch, Pritchard, and Co.	London	27	15	3
Williamson, H.	"	10	0	4
Barnett Bros.	Birmingham	18	18	2
Holloways, R.	Landport	11	0	0
Silverston and Co.	Birmingham	13	0	0
Sloane and Carter	"	262	7	10
Stedall and Co.	London	10	0	0
Whitehart	Landport	10	0	0
Penman	"	18	0	0

Chester.

Allmark, Albert, 15, Bridge Street, and 3, Plum Terrace, Garden Lane, Chester, watchmaker and general dealer. Trustee, Francis R. Price, The Eastgate, Chester, accountant. Unsecured Liabilities, £441 8s. 10d. Estimated Net Assets. £53 18s. Deed of Composition, March 13, 1890; filed March 14, 1890.

Creditors.		£	s.	d.
Rathbone, W.	Burslem	11	0	0
Box, C.	Chester	11	0	0
Allmark, Elizabeth	"	150	0	0
Nixon, Mrs. (rent)	"	30	0	0
Dods and McNeilly	Liverpool	41	0	0
Hollingshead and Walker	"	19	0	0
Solomon and Co.	"	10	0	0
Knight, L. S.	Manchester	25	0	0
Barder, A.	"	12	0	0
Bowie, J., and Co.	"	10	0	0
Lewtas, H. and G. O.	"	10	0	0

Lancaster.

Dodge, W. and M., 21, Market Place, Manchester, jewellers, goldsmiths, and silversmiths (partners, William Dodge, 14, Birch Polygon, Rusholme, Manchester, and Morton Dodge, York Place, Chorlton on Medlock, Manchester, trading as). Trustee, Edgar Wheeler, Birmingham, C.A. Unsecured Liabilities, £6,284 4s. 10d. Estimated Net Assets. £7,106 15s. 5d. Deed of Composition dated March 19, 1890; filed March 24, 1890. Deed of Assignment, supplemental to a Deed of Inspectorship and Letter of License dated March 28, 1889; and filed April 4, 1889.

Creditors.		£	s.	d.
Allday and Son, I.	Birmingham	85	9	2
Blogg and Wigg	London	14	17	0
Bourne, H.	Birmingham	190	3	1
Cunliffe, Brookes, and Co.	Manchester	68	1	8
Carley, G., and Co.	London	61	10	10
Chapman, C., and Son	,,	22	3	6
Dodge, Eliza	Manchester	400	0	0
English Watch Co.	Birmingham	25	4	0
Feldenheimer and Co.	London	77	19	3
Fenton Bros.	Sheffield	89	2	10
Griffith, H., and Son	Birmingham	1,660	10	7
Goddard, I.	Manchester	323	15	1
Guibaudet, Gustave	Paris	53	10	0
Hutton, W., and Son	Sheffield	38	0	4
Hirsch and Pritchard	Paris	53	8	0
Jacobs, E., and Son	Birmingham	1,035	13	2
Jacobs, Eli, Exors. of	Manchester	220	0	0
Kettle and Messenger	London	39	5	2
Konschel, W. and Co.	,,	20	0	0
Manton and Mole	Birmingham	892	9	2
Muirhead, Exors. of	Manchester	155	12	0
Pritchard, W. R., and Co.	London	28	7	6
Quilliam, S., and Son	Liverpool	113	10	0
Robbins and Appleton	London	15	4	6
Roberts and Belk	Sheffield	27	9	3
Schuttner, G.	Manchester	69	14	11
Smith, S. W., and Co.	Birmingham	11	18	0
Smith, I., and Son..	London	105	5	2
Usher and Cole	,,	74	13	5
Wootton, S., and Co.	,,	38	18	4
White, I.	Coventry	88	7	6
Williams, I., and Co.	Bristol	95	2	10
Ward, E.	Manchester	35	12	9
Overseers of the Poor	,,	25	0	0

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller, and Silversmith, 7, *St. Paul's Churchyard, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller, and Silversmith.*

TRIAL OF CHRONOMETERS AND DECK WATCHES AT THE ROYAL OBSERVATORY IN 1890.

CHRONOMETERS.

The annual trial of chronometers at the Royal Observatory, Greenwich, will commence this year on July 5, and will be for a period of twenty-nine weeks. The chronometers will be tested in the oven for two periods of four weeks each at temperatures ranging from 75° to 100° Fahrenheit, and also at the ordinary summer and winter temperatures of the room.

Application for permission to send chronometers for trial must be made to the Hydrographer of the Navy, Admiralty, S.W., not later than Monday, June 16, and no chronometer can be received at the Royal Observatory later than Monday, June 30.

DECK WATCHES.

Chronometer makers who may desire to send watches to this trial must first obtain permission from the Hydrographer, Admiralty, Whitehall, S.W., to whom all requests for such permission must be sent not later than October 6.

The watches are to be deposited here between the hours of 10 and 1 on any day (excepting Sunday) during the week ending with Monday, October 20, after which date no watch can, under any circumstances, be received.

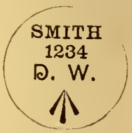
The rating this year commences on Saturday, October 25, and will be as follows :—

Watch Horizontal, dial up, in room for 6 weeks.
,, ,, ,, in oven ,, 1 week.
,, Vertical, pendant up, in oven for 4 days.
,, ,, ,, right, ,, 3 ,,
,, ,, ,, left, ,, 3 ,,
,, ,, ,, up, ,, 4 ,,
,, Horizontal, dial up, ,, 1 week.
,, ,, ,, up, in room for 6 weeks.

The mean temperature in the oven will be from 80° to 85° Fahrenheit.

The watches are to be in silver cases, with crystal glass, and each must bear a distinguishing No. engraved on the plate of the movement. Preference will be given to keyless watches.

Each watch is to be labelled with its price, which is to include a mahogany box with ivory label, cleaning after trial, and engraving the Government mark on the dial and plate of the movement, and the name of the maker, the No. of the watch, the letters D. W., and the Government mark on the ivory label of the box, as in the annexed form :—



W. H. M. CHRISTIE, *Astronomer Royal.*

Royal Observatory, Greenwich,
March 8, 1890.

THE COLONIAL TRADE.

Sir,—The December number of your interesting journal to hand, and your remarks on the above subject call forth thoughts of the unsatisfactory manner in which the colonial trade is catered for by the Australian wholesale houses.

The vast continent of Australia, with its rapidly-increasing population, is a good and grand field for the English manufacturer to look forward to. No country in the world is likely to produce a better market for the favourable attention of manufacturers.

The Americans are doing a good and increasing trade with us in electro-plate, cutlery, and especially watches. The Elgin and Waltham companies both have had depôts established here for years past, and thousands of their watches are sold every year, more especially gold. Were the English manufacturers to take a lesson from them in the catering for our trade, by producing an article with the variety of designs in cases, movements, prices, etc., you would have a good output.

This is one of the many lines you overlook. Our wholesale houses here keep such wretched stocks of old-fashioned goods that it is difficult to obtain even ordinary requirements, to say nothing of the excessive prices charged by them, from 50 to 100 per cent. over manufacturers' prices, a state of things that should not exist.

In silver watches there are only about two makers' goods kept by our wholesale houses, Rotherham's and Ehrhardt's, and for weeks at a time there are none in the market. For some reason or other they do not introduce other makers' goods, although there are plenty quite as good. For years past I have imported for Victoria, South Australia, and Tasmania a far more reliable class of watches, of the C. J. Hill make, of Coventry, at the same or a little less price, with entire satisfaction. If a reliable article is sent out it rests with the shopkeeper, who is the best judge, to sell an article that will give satisfaction, no matter who the maker may be.

It is now time for the English manufacturers to open their eyes to see the vast trade to be done with Australia, and if the monopoly of colonial houses will not supply English goods as required, at fair prices, to establish a manufacturers' association to protect themselves, with one or two branches in Australia to introduce the goods of different manufacturers. Many of our leading shopkeepers are beginning to import their own goods, but still they require and desire more information as to manufacturers and prices.

Trusting this will cause the British manufacturers to look to their laurels before the Americans sweep the whole from them,

Yours truly,
THOMAS B. WAY.

Goldsmiths' Hall, Melbourne.

LI[illegible]
MA[illegible]
U. S. PA[illegible]

The
Watchmaker, Jeweller & Silversmith.

EDITED BY D. GLASGOW, JUN.

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. THE WATCHMAKER, JEWELLER AND SILVERSMITH will be found an exceptional medium for advertising. Special Notices, Situations, &c., per insertion, 1s. for two lines, prepaid.

Address all business communications to the Publishers,
MESSRS. TRUSLOVE & SHIRLEY,
The Watchmaker, Jeweller & Silversmith,
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Birmingham Branch: 22, HYLTON STREET.

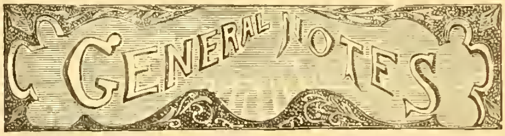
Agents for New South Wales and Queensland:—
MESSRS. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

THE Easter holiday—or recess, as some prefer to call it—operated so differently upon the various branches of the jewellery trade that it would be more than difficult to judge with any degree of accuracy its effect upon the trade as a whole. Whether it has even been in the aggregate beneficial or otherwise cannot be confidently asserted. One thing that may be said, however, is that many manufacturers hailed its approach and advent with a good deal of satisfaction, as affording them an excuse for shutting up (or as the Yankees say, "shutting down") for a few days during a dull period. Many (including the majority of the Birmingham trade) utilised the opportunity for taking stock. This stock-taking, by-the-way, is one of those necessary evils in connection with businesses of any magnitude which must be undertaken at periodical intervals of time whether a firm is busy or not, so that when it can be done during Eastertide a distinct saving is effected. In cases where firms had largish orders in hand before this suspending of operations, a large amount of work accumulated toward the end of the month, and it may be expected that business will be brisk in many quarters until the arrears are wiped off, but it cannot be denied that the tone of a large proportion of the trade is decidedly pessimistic—whether the present state of business justifies this feeling or not, is (considering the somewhat abnormal conditions we have above indicated) almost impossible to say. As it takes so very little, either way, to buoy up or cast down our manufacturers, a better trade done during the next few weeks would put a different face on matters.

WE publish on another page the statement of the Chancellor of the Exchequer (extracted from the Budget speech) with respect to the abolition of the duty on gold and silver plate. In that statement Mr. Goschen shows that the total cost to the country of the remission of this duty will amount to about

£200,000, made up of a loss of revenue of £80,000, and an estimated drawback of £120,000. The drawback will be paid on claims on plate manufactured within two years back from the time of the remission of the tax. In his proposal, Mr. Goschen is at pains to give a reason for abolishing the duty, but the only reason he gives is the report of the Parliamentary Committee of 1878-9, and the claims of the Indian community, who, as he says, attaching undue importance to the abolition of the duty, think to be able to send more manufactured silver into this country. Well, perhaps it will enable them to do so, and perhaps it won't. The question is, should the claims of the Indian community outweigh those of the home trade, a considerable portion of whom are strongly opposed to the scheme and have entered their protest. But still, another question arises, and that is, what portion or section of the trade here is it that opposes the remission? Is it the manufacturers? We think no very large proportion of them. Is it the stock-holders, and if so, what are their reasons in the face of getting a drawback? Perhaps they do not consider the drawback sufficient. The pawnbrokers are, we know, opposed to the scheme, but they have adduced no very adequate reasons for their opposition. As for the manufacturers of gold and silver plate, we think they will soon get over whatever little temporary inconvenience such legislative changes always occasion, and, looking at the principle that taxes on industry are bad in the abstract, recognise the measure as a good and necessary one in regard to the export trade and foreign competition.



A new ornament for the feminine waist is a tiny hour-glass containing fine golddust instead of sand.

The latest novelty in jewellery is, according to the *Court Journal*, the pointed jewelled belt made to be worn with any evening dress.

According to a Chicago contemporary there are a dozen factories in Amsterdam kept busy night and day making genuine old spoons, knives and forks for idiotic American tourists.

A jeweller's shop in Piccadilly, Accrington, owned by Mr. Wilson, was entered through the roof last month, and about £20 worth of second-hand watches was stolen.

Dissolution of Partnership.—Messrs. Weill and Harburg, of 3, Holborn Circus, E.C., have dissolved partnership by mutual consent. Mr. Weill having purchased the assets and liabilities, will continue the business at the same address under the style of Weill and Co.

Experiments with the Optical Lantern.—On February 25 last, an interesting paper was read at the Warrington Literary and Philosophical Society on the above subject by Mr. Thomas Fletcher, F.C.S. The printed pamphlet can now be procured from the Society or from the *Guardian* Office, Warrington.

Pre-Victorian Gold Coins.—The Chancellor of the Exchequer stated in the House, last month, that by the withdrawal from circulation of 2,171,000 sovereigns and 210,000 half-sovereigns, the total deficiency was £44,000. The calculation as to loss by the coins was 4s. 6d., whereas the actual loss was 4s. 7d.

The Queen has placed the order for her 100-guinea cup to be sailed for by the Royal Albert Yacht Club during the coming season with Messrs. H. M. Emanuel and Son, court jeweller, of Ordnance Row, Portsea. The same firm have been selected by the stewards of the Salisbury Races to make the 200-guinea cup to be run for in May next.

Prince Bismarck possesses no fewer than 103 decorations, of which fourteen are set in diamonds of great value. He does not belong to any English Order, nor is he a knight of the St. Stephen of Hungary, which is the Emperor of Austria's great Order; but the late Czar gave him the St. Andrew, which is the first Order in Russia, and his diamond star belonging to this Order is worth £10,000.

Sir R. Palmer Harding, Chief Official Receiver, and Mr. W. W. Aldridge, Official Solicitor, formally took their leave on March 31 of the London Bankruptcy Court, their resignations taking place by reason of the new regulations of the Board of Trade. Registrar Brougham, on behalf of the officials of the Court, and Mr. Cooper Willis for the Bar, expressed their regret at the departure of the old officials.

Watch and Clockmakers' Asylum.—Mr. E. Sprigg was the chairman at the thirty-seventh annual meeting of the friends of this institution, held last month in Northampton Square. The report, which was read by the secretary (Mr. T. Taylor), expressed regret that the subscriptions fell below those of last year, although owing to the generous donations of £300 from the Goldsmiths' Company, and £51 from the Clockmakers' Company, the committee were able to carry out the operations of the institution as successfully as in previous years.

The Duty on Silver.—The Goldsmiths' and Silversmiths' Company has addressed a letter to the Chancellor of the Exchequer thanking him for having settled the long and vexed question of duty on gold and silver plate. They renew a suggestion made to Mr. Childers, when he attempted to deal with the matter—viz., to allow the drawback only on goods manufactured within twelve or eighteen months from the date of the repeal of the duty. As the largest manufacturers and holders of plate, the company contend that this is fair and equitable, and that houses which have an accumulation of old stock are not entitled to a drawback on it.

Silversmiths and the Silver Duty.—Mr. Howard Vincent presented to the Chancellor of the Exchequer last month, a petition signed by the principal manufacturing silversmiths of Sheffield and London, praying that the duties on silver may be left undisturbed, and the practice of Hall-marking continued. The petition was signed by twenty-six Sheffield firms and twenty-three London firms. There is throughout the trade a conviction that in spite of this probably unprecedented demonstration in favour of taxation, the abolition of the duty on silver plate forms a portion of the Budget scheme to be disclosed to-morrow.

Duty on Gold and Silver Plate.—The following letter was published in the *Irish Times* on the 24th ult.:—Sir,—I have observed some letters during the past few days in your paper, from various jewellers who are good enough to ventilate their opinions for the information of the Chancellor of the Exchequer, all of whom are "the largest holders of plate in the world." I wish to inform those gentlemen that the term on which rebate will be allowed on new and unused silver has been decided upon, and will be publicly announced in a few days. The only question now under consideration is the rebate of duty on wedding rings, and I would strongly recommend the jewellers of Ireland not to add to their stock of the above, as it is highly probable rebate cannot be allowed on these.—Yours, etc., Edmond Johnson, Master of the Corporation of Goldsmiths for Ireland, 94, Grafton Street, Dublin. April 23, 1890.

A Silversmith's Grievance.—Messrs. Sibray, Hall, and Co., of the Fitzwalter Works, have pointed out to *The Engineer* what seems to be a very real grievance under which the silversmiths at present labour. According to the statute, the assay master is compelled to destroy good silver with bad. For example, if a manufacturer sends £5,000 worth of goods to be assayed, and these goods include a pepper-box which has a knob not up to standard, the assay master is obliged to destroy the whole lot through that miserable little knob, and, in addition, to charge the unlucky owner 6d. per ounce for doing it. They urge that the goods should be returned to the owner. They would be useless for sale until they were assayed, but he sees no reason for wasting all the perfect workmanship for the sin of the imperfect piece. Of course, says our contemporary, it may be asked, why does the manufacturer put a bad knob on a good vessel?

The Silver Trade.—The abolition of the duty on silver plate, though disliked and disapproved in Sheffield, was not unexpected. The Chancellor of the Exchequer has to take a wide survey, and put the necessities of one class against the wishes of another. Hence it is, says the *Sheffield Daily Telegraph*, that the firms in Sheffield which petitioned against the remission of the duty find their efforts unavailing. The retention of the Hall-mark, and the reservation of £120,000 for drawback, though this sum is regarded as inadequate, tend to lessen the local regret felt at the disappearance of the duty. A good deal of additional work will be thrown upon the various assay offices in preparations for the distribution of the drawback, and strict regulations are expected to be issued with regard to its payment. As there are only four assay offices in England, viz., London, Birmingham, Sheffield, and Chester, a great quantity of plate will find its way here for verification by the assay officer. The remission of the duty means a reduction of 1s. 6d. an ounce in the price of silver

Queensland Opals.—A very large trade in Queensland opals is now being done here, says the Brisbane correspondent of the *British Trade Journal*. The additional tax imposed upon imported jewels is responsible, in a measure, for this, but it is also owing to the beauty of the local designs in jewellery generally. As soon as Messrs. Flavelle Bros. and Roberts, of Queen Street, were made aware of the intentions of the Government with respect to the new tariff, they resolved upon making colonially-manufactured jewellery a special feature of their business, and with this end in view brought from England several skilled workmen—notably, a jewel cutter and jewel setter.—*British Trade Journal Correspondent at Brisbane*, Jan. 11, 1890.

The Gilbert Centre-piece.—The magnificent centre-piece for the Queen's table, upon which Mr. Alfred Gilbert, A.R.A., has been engaged for two years past, is now nearly completed. Probably nothing so fine in the way of art silver work (says the London correspondent of the *Liverpool Mercury*) has been done since the days of Benvenuto Cellini. In its composition some 2,000 ozs. of silver have been employed. It is difficult—indeed, almost impossible—to describe the richness of the design. It is fantastic throughout, containing countless figures of many kinds, and the whole is surmounted by a mermaid clasping a crystal ball. In the tail of the mermaid, as also in several of the minor figures, mother-of-pearl has been inlaid, and adds much to the general effect.

Charles Wood, 20, pawnbroker's assistant, of Suffolk Street, Forest Gate, was charged at Worship Street, last month, before Mr. Montagu Williams, with having stolen, on the 4th inst., from the premises, 16 and 17, Whitechapel Road, 103 gold and silver watches, 53 gold chains, 18 gold necklets, 14 gold brooches, 50 pairs of gold earrings, 5 gold lockets, 13 gold bracelets, 356 gold rings, and a large quantity of other jewellery, valued at £850, the property of the executors of John William Fryett. Mr. Attenborough, solicitor, appeared for the prosecution, and said the prisoner had been found at Hastings, where he was enjoying himself. He asked for evidence of the arrest to be taken, and a remand granted. Detective-Sergeant Thicke, H division, deposed to bringing the prisoner from Hastings and to telling him the charge. The prisoner said he had been left alone in the place at night by the manager, and the temptation to steal was too great, and he could not resist it. The prisoner had given information which would lead to the recovery of part of the property.—Mr. Montagu Williams remanded the prisoner.

The Electrical (Edinburgh) Exhibition and the Magnetisation of Watches.—M. J. W., writing to the *Scotsman* under the above heading, says: In reference to the remarks made by "W. W. E" in to-day's *Scotsman*, I beg to state that when electricity was first tried in lighting Princes' Street for a short time, the dynamos were placed under the arches of the road leading from Leith Wynd to the southern arch of the North Bridge. I went, by invitation, with some friends to see the working of the dynamos, etc. As soon as we entered the arch, the party in charge said: "Gentlemen, you had better leave your watches here in case they may get magnetised, as I had mine completely ruined by being magnetised some time ago." To test the effect of the power of the dynamos, he took an ordinary clasp knife and simply waved it at a long distance from the dynamos, when it was instantly magnetised. I would, therefore, strongly advise everyone visiting the Exhibition either to leave their watches at home, or let the executive of the Exhibition provide a safe place where they may be kept.

The following letter was published in the *Financial News* of the 17th ult.:—Sir John Bennett, Limited.—To the Editor of the *Financial News*.—Sir,—As a shareholder in this company, and on account of the very unsatisfactory report of the directors, I would strongly advise all shareholders to refuse to sign any of the proxies sent them, which would practically place them entirely at the mercy of the directors, and without, in my opinion, conferring any corresponding benefit, the shares being practically unsaleable. Notwithstanding the glowing terms in which the prospectus was issued to the public, and although the ordinary shareholders were to have received 16 per cent., we have got nothing. As a Mr. T. Russell, of Liverpool, has lately been sending out a large number of circulars, one of which was addressed to myself, recommending his own watches, clocks, etc., it would be interesting to know whether that gentleman is the same individual whose name appears on the board of directors of this company. Perhaps the question could be asked at the meeting.—I am, sir, yours, etc.—An Ordinary Shareholder.
April 12.

The Budget Speech and Wedding Rings.—The effects of the recent Budget speech have been further reaching, says the *Glasgow Evening News*, than even the astute Chancellor of the Exchequer had foreseen. It could hardly have been expected that the announcement in the speech with reference to the duty on gold plate would be equivalent to placing a temporary indirect tax on matrimony, but such seems to be the case. A temporary check in the sale of wedding rings has been felt consequent on the new Budget proposals; and though such an effect can hardly last long, it may present a knotty problem to those contemplating investment in that cheap, indispensable to the matrimonial ceremony. Crises, due to financial and other causes, have at times occurred in which the inelegant door-key and the umbrella or walking-stick ferrule have had to do duty instead of the orthodox ring, but it is to be hoped that the situation will not become so serious as to necessitate resort to these extremes. The tendency nowadays is happily to encourage matrimony, and doubtless unforeseen circumstances which may cause trouble to the humble aspirant will be speedily removed.

The Diamond Monopoly.—Further developments go to support the view I have persistently maintained, says the correspondent of a Birmingham contemporary, that the diamond monopoly must sooner or later collapse. Though there may be no crash like that resulting from the breaking of the copper ring, not all the wealth of St. Swithin's Lane would suffice to maintain present artificially-enhanced prices side by side with increasing supplies. There are far richer mines in the sphere of the London and South African Exploration Company than the best of those in possession of the monopolists. All old stayers anticipate the former will come best out of the fight, both as to the points in litigation and ultimate commercial success. It is all moonshine for the old companies to pretend that the new districts have already been tried and found wanting. Some are virgin and others have been "tried" by the sort of surface scratching from which, more than once previously, the now proved richest of the Kimberley mines had been pronounced worthless. I fancy there is a good deal of cautious "unloading" going forward by original shareholders in a much-bulled diamond stock, and when a speculative outside public are sufficiently gorged at the preposterous premiums, we may expect a rapid change of policy—to the benefit of manufacturing jewellers and diamond buyers generally.

A WATCH WITH A HISTORY.—At the Cardiff police-court last month, a young man who gave the name of John Matthews, and who stated that he was the son of the late well-known Jack Matthews, the landlord of the old "Flying Eagle" in Charlotte Street, was charged with having been drunk and disorderly in Caroline Street on Tuesday evening. This being his first appearance before the bench, he was dismissed. In the possession of the defendant when searched, was a watch with a notable history. In the year 1870, Captain James Owen, a well-known trader, who lived at this port, was presented with an 18-carat gold repeater, of American manufacture, by the President of the United States, for the conspicuous bravery displayed by him in rescuing the crew of the schooner, "Georgie Todd." About 15 years ago Captain Owen lost this watch, and although the police instituted inquiries, their search proved unsuccessful. The gallant captain has since gone to his fathers, but his brother, who also follows the sea as a skipper, still resides in the town, and the police having accidentally come across the chronometer, he was called to the central station, where he had no difficulty in identifying the watch, which bore the following inscription inside the case:—"The President of the U.S. to Capt. Jas. Owen for the rescue of the American schooner, Georgie Todd, 1870." On the obverse side is an enamelled medallion illustrative of a brave attempt at rescue, and on the reverse are the arms of the United States Government. The watch, it may be added, is estimated as being worth £70. Matthews explains that his father acquired it by purchase from a Cardiff pawnbroker, and bequeathed it to him.

The Diamond Market and Metals.

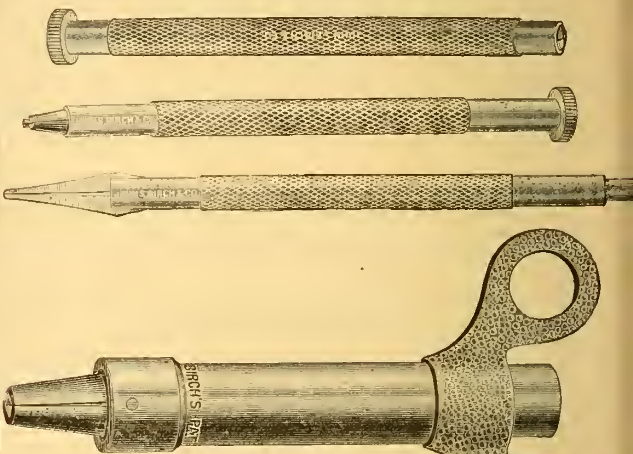
THE DIAMOND MARKET.—Both the *Amsterdam* and *Paris* cutters are in an exceedingly bad way, many being out of employment, and present circumstances of the trade do not point to any prospects of immediate improvement while the high prices for rough are maintained. Numerous dealers have retired from the business altogether, or, at all events, until things relatively improve. It is stated by experts in the trade that it will take years to persuade retail buyers in many markets—and notably those of *South America*—that the prices they are now compelled to demand for the finished goods are normal. Meanwhile, said would-be buyers are holding their hands in expectation of the fall that is so long a-coming. A good many foreigners were in *London* during the past month, but bought only for immediate requirements, and that smally.

METALS.—The latest official quotations are as follows:—*Silver*.—Nearest quotation obtainable, 48d. per oz. *Copper*.—Chili bars, G.O.B.'s and G.M.B.'s, cash, £47 12s. 6d. to £48; three months, £48 to £48 7s. 6d. *Tin*.—Fine foreign, cash, Straits, £89 12s. 6d. to £90 2s. 6d.; Australian, £90 to £90 10s.; three months, Straits, £90 10s. to £91. *Lead* is steady. Spanish soft, £12 10s. English, ordinary brands, £12 12s. 6d. to £12 15s. *Spelter* continues quiet. Ordinary brands, £20 10s.; special ditto, £20 15s. English soft, V & S, £21 10s. Swansea. *Quicksilver*.—The importers' price is £9 10s.; and second hands, £9 6s.

TRADE NOTES

NEW PUBLIC CLOCK FOR LEEDS.—The Leeds School Board have, by placing a large clock on the new school buildings which are now nearing completion at Richmond Hill, conferred a great boon on the inhabitants in that part of the borough. The clock has been made by Messrs. Wm. Potts and Sons, Leeds, and has four external dials, 6ft. each in diameter, and adapted for illumination at night. The corporation has decided to supply the gas for the illumination. There is an automatic apparatus for lowering the gas according to the season of the year. The dials are visible for a considerable distance, and the clock is rendered still more useful by the fact that it strikes the hours upon a bell weighing over five cwt. The clock is constructed from the plans of Lord Grimthorpe, and has all the latest improvements with gravity escapement, compensation pendulum, etc.

NOVELTIES IN WATCHMAKERS' ACCESSORIES.—Messrs. John S. Birch and Co., of 79 and 81, Washington Street, Brooklyn, N.Y., have forwarded us the blocks of some novelties for watchmakers they have just introduced to the market, the annexed illustrations of which will make their uses clear to the trade. These useful tools, all of which are constructed on the "key that will wind any watch" principle, will doubtless soon be received with as great favour as the watch keys manufactured by the same firm have been. They can be obtained from all material dealers, or from the American Trading Co., 99, Fenchurch Street, E.C.



*WATCH AND CLOCKMAKING IN 1889.—We have just received from the author, Mr. Tripplin, this interesting and instructive book which he entitles "an account and comparison of the exhibits in the horological section of the French International Exhibition." Under appropriate headings, each chapter is devoted to a critical analysis and comparison of the various branches of watchmaking as practised at home and abroad in its latest developments. From horological literature to the hallmarking question, almost every conceivable subject likely to be instructive to the trade is touched upon in this little book, which should be in the hands of every progressive watchmaker.

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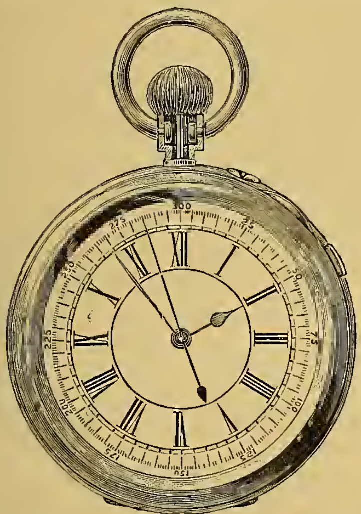
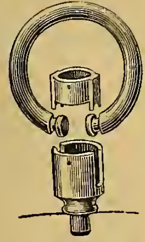
* By Julien Tripplin, F.R.A.S., etc. London: Crosby, Lockwood, and Son, 7, Stationers' Hall Court, E.C.

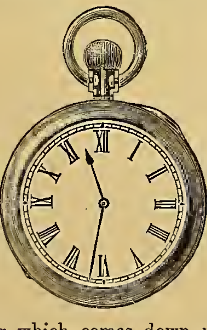
The Coventry Patent Pendant and Watch Case Co., Limited.

UNDER the above title a new company has just been incorporated for the manufacture of machine-made watch cases, with a capital of £30,000 in 30,000 shares of £1 each. The company has been formed for the purpose of manufacturing watch cases and for acquiring two patents, the principal of which is that known as Turner's Patent Safety Watch Bow and Pendant, which we are enabled to show in the annexed cuts.



The illustrations show clearly this invention and the method of fastening the bow to the pendant. When fixed together the whole is as solid as is the ordinary bow and pendant, while the projections at the end of the former completely prevent it from being pulled or twisted off, securing complete immunity to the wearer from the loss of his watch by the ordinary method of the pickpocket. Moreover, the plug which comes down upon the pivots of the bow allows of a tight adjustment of the bow in the pendant, and the whole is a better plan of fastening the bow than is either that of screwing it or merely springing it into the apertures. As we have only the preliminary prospectus before us, which is issued as "private and confidential," we are prevented from going at present into further details of the scheme, but we can say this much, that the manufactory of cases complete, fitted with these pendants, is, and has been for some time, a going concern, and, as soon as the allotment is an accomplished fact, a factory will be built at Coventry, the most approved modern machinery laid down, and the trade supplied with first-class gold, silver, and metal cases, at prices that should enable English watchmakers to compete with all comers, be they whom they may.





Midland Jottings.

*** *Correspondence for "Midland Jottings" should be addressed to the Editor at the Birmingham Office, 22, Hylton Street, Birmingham, where it should arrive not later than the 20th of each month.*

Owing to the holidays and the stock-takings, last month was an exceedingly dull one in the Birmingham jewellery trades, and although business recovered somewhat towards the end of the month, this was due rather to the accumulation of orders, unexecuted owing to the first-named causes, than to any fresh influx of trade. In fact, manufacturers (with a few notable exceptions) are not at all satisfied with the present outlook, and some even go so far as to predict another near period of depression. That there is at present serious ground for complaints in many quarters is undeniable, but it is to be hoped that the worst is yet a long way off.

The question of the abolition of the plate duties does not excite so much attention among Birmingham jewellers as it does in some other communities, such as the Sheffield silver-plate trade, who are more deeply concerned with the likelihood of foreign (and more especially Indian) competition, and a casual run through the trade would show that very little interest has been developed on the subject. The uncertainty as to the rebate being allowed on wedding rings is, however, claiming some attention at the hands of manufacturers of these social essentials

We believe there were no Birmingham manufacturers' names in the list presented to the Chancellor of the Exchequer by Mr. Howard Vincent, in favour of the retention of the plate duties and of compulsory Hall-marking.

Messrs. B. H. Joseph and Co., of Frederick Street, Birmingham, have just completed a handsome set of silver bells of Moorish design for the Scrolls of the Law for the Leeds Congregation (Hebrew). They bear the following inscription:—"Presented by Morris Blackston, March, 1890." They were supplied by Messrs. Kirk and Co., of Leeds. Messrs. Joseph and Co. have also manufactured an elaborate silver breastplate and pointer (Moorish design) for the Sunderland Congregation, to be presented to the congregation by the sons of the late Mr. Wolfe; supplied by Messrs. Rhodes and Sons (Ltd.), Bradford.

The new Birmingham Technical Art School for jewellers and silversmiths seems to be meeting with a fair measure of attention at the hands of the trade generally. The guardians of the Birmingham Assay Office having offered a donation of £500 to the funds provided that the trade show proof of the requirement, a memorial is being sent round and numerously signed by the trade to that effect.

Mr. A. Iliffe, one of Messrs. Elkington and Co.'s managers, died suddenly on Monday evening, the 14th ult., at his residence, New Road, Bromsgrove. He had just returned home from business, and on going upstairs, fell upon the landing and never recovered; he leaves a widow and three young children. He was highly respected in his circle and the trade. The cause of his death was heart disease.

The following removals have taken place in the Birmingham jewellers' district recently:—Messrs. Marlow and Vaughton, manufacturing jewellers, from Frederick Street to Warstone Lane, into premises occupied for some years by Mr. Edward Vaughton, father of the latter; Messrs. Cashmore and Bushell, from Warstone Buildings, Warstone Lane, into larger premises in Upper Hockley Street; and Mr. Alldrige, stud and solitaire manufacturer, from Brearly Street to Spencer Street, where he has had the premises altered and fitted up to suit his requirements

Monday, April 21, was a gala day with the good folk of Coventry, who celebrated the opening of the restored steeple of St. Michael's Church by the Archbishop of Canterbury by making a general holiday. Not that there is anything very new in the Coventry workman celebrating a Monday—that has always been a Saint's day with him—but on this occasion the event justified the celebration, and was naturally taken full advantage of. The town was gaily decorated with bunting, and all the neighbourhood and his wife were there clad in their best.

It is not quite certain, even now, if the vexed question of the bells of the tower is yet settled, as every now and then a sort of recrudescence of the controversy anent their suspension and the way in which they are to be rung breaks out, but it is probable that the good sense of the people who have the settlement of the matter will finally decide to "listen to the voice of the experts," who have given it as their opinion that it would not be safe to swing them, hang them in the restored tower, and clapper them.

Going over the new watch movement factory the other day, in company with one of the directors, we were really surprised—in the face of the adverse criticism and opposition (which can only be designated fractious) to the scheme—at the forwardness and general appearance of readiness for future possibilities which the whole buildings present. The new buildings are erected on a suitable site at the back of Spon Street, and are eminently adapted for the purpose for which they are intended. The main building consists of an oblong room of one storey, built on the Lancashire weaver shed principle with serrated roof, capable of seating some 150 workpeople, in which the benches run lengthwise and the Northern light comes down on the right-hand side of each bench worker.

Just now, the company are confining their operations to the manufacture of movements for immediate requirements, on the old Lancashire system, with the machinery available, one of the Scarisbrick Brothers being in charge, but it is intended, as soon as necessary arrangements can be made, to lay down machinery of the most approved modern type and start the manufacture on a large scale. When it is considered that with the capital raised it will become imperative for the Prescot Company to manufacture the complete watch, the necessity of the Coventry venture in self-defence should be obvious to the most obtuse. We trust to hear shortly that the whole of the shares have been taken up. Even apart from this, and with the present directorate and capital subscribed, the success of the undertaking is assured.

Mr. Charles J. Hill, of Russell House, Coventry, in reference to a par. in our Midland Jottings of last month, writes us:—Seeing you take an interest in the marks obtained at Kew for 'positional adjustment,' I beg to say that I have just received a Class A certificate for a centre-seconds watch, No. 138,154, obtaining *37·7* out of a possible *40*, and a total of 81 marks.

In the Birmingham County Court (before his Honour Judge Chalmers), Joseph Meyers Davis, 34, Frederick Street, stone dealer, on March 28 sued C. S. Miller, trading as Miller and Co., 72a, Vyse Street, jewellers, for £13 5s. 3d. for "paste" diamonds. Mr. Linzell, instructed by Mr. Montgomery Hooper, was for the plaintiff; Mr. Dorsett, instructed by Messrs. G. B. Lowe and Sons, was for the defendant. Plaintiff's case was that he sold a job lot of paste to the defendant; that they were returned in a fortnight as unsatisfactory; that he immediately sent the goods back, and pointed out that the goods had not been sold on approbation; and that, while he was prepared to try to re-sell the stones for the defendant, he could not accept them as returned. Defendant contended that the stones were sold on approbation. After an action had been commenced, plaintiff's collector called at defendant's warehouse as usual, and defendant then paid him about half the value of the stones, and his manager altered the bill to make it a settlement. The invoice put in was not the usual invoice for goods sold on approbation, and it did not appear that a letter—on plaintiff insisting that as the stones were sold as a job lot they could not be returned—had ever been answered. His Honour gave judgment for the plaintiff.

SHEFFIELD NOTES

From Our Correspondent.

To Messrs. John Round and Son belongs the honour of having brought out the latest and most striking novelty in the silver trade. To the casual observer it is the ordinary centre-piece of the breakfast or dinner table—graceful in design, it is true, but not differing otherwise in appearance from what may be seen in dozens of show-rooms in the town. The turning of a small tap, however, at once brings the peculiarity of this centre-piece into notice. A thin jet of water is thus made to ascend from the ornamental figure on the top and to fall back in spray into the glass dish placed for the reception of flowers. The height of this jet may be regulated from twenty feet down to two inches by simply turning the tap to a greater or less extent. The principle of the thing is altogether different from that of the miniature fountains one sometimes sees in shop windows, and is simplicity itself when once it is explained. The water is forced from a receptacle in the bottom of the centre-piece by compressed air. It is said that George the Fourth could never make out how apples got into pies, and in like manner some people may wonder how the compressed air is introduced into the receptacle which holds the water. There is no practical difficulty, however, about it; when the water is exhausted the reservoir is simply replenished by means of a flexible tube provided for the purpose. The compressed air takes care of itself—it is safe to be found in its place when wanted. This contrivance is fully protected by patent, of which Messrs. Round and Son possess the sole right. Arrangements have been made for turning out any number of these centre-pieces in a great variety of designs, and we may safely predict that in a short time their use will be almost universal.

The Bill introduced by Mr. Broadhurst into Parliament to amend the Act relating to false marking is not giving unmixed satisfaction in Sheffield. The "little mesters" are up in arms against it. These may be described as manufacturers in embryo. They spring from the working class, but they aim at ultimately becoming full-blown manufacturers. Most firms in Sheffield have gone through this process at one time or other. During the transition period, the "little mester," being a man of no capital, works for the big manufacturer and strikes the latter's mark upon the goods he makes. Mr. Broadhurst's Bill strikes at the root of this practice, and would thus annihilate the class of "little mesters." It is very questionable whether this is a desirable consummation. Anyhow, this is scarcely the class of cases the original Act was intended to meet. One can scarcely call a mark thus struck a fraudulent mark. At all events, this is the opinion of a large and energetic section of the community here.

Some cynical people don't believe in presentations. Having no hope of ever receiving a testimonial myself, and being sometimes called upon to subscribe towards those intended for other people, I have a considerable amount of sympathy with this view. Silversmiths, however, have no reason to regret the practice of "testifying to the respect and esteem, etc., etc.," with which prominent persons in various walks of life are regarded. Moreover, the custom of making presentations affords a stimulus to artistic design sadly too deficient in the getting-up of articles of more everyday use. From this point of view, therefore, the determination of the working-men of Sheffield to give something to the Ven. Archdeacon Blakeney, by way of showing their admiration, may be regarded as eminently satisfactory. The concrete expression of this feeling may be seen in the show-room of Messrs. John Round and Son in the form of a dessert service of the best Sheffield plate. There are five pieces in all—the centre one rising to the height of forty inches. The design is renaissance in character, a style which lends itself to the most effective artistic treatment in this class of work. At the base of a circular plinth on the centre-piece stands four finely-modelled figures representing the fruits of the earth, while from the centre rises a stem supporting a fine cut-glass fourteen inches in diameter, and above this is another glass of trumpet shape which adds to the imposing effect of the whole. The side pieces also are ornamented with figures. The ornamental chasing at the base of the plinth and plateau is of the most elaborate and tasteful character, and the general effect is most pleasing. The firm are to be congratulated on the possession of an artist capable of designing such a piece of work, and of artisans able to carry his ideas into effect.

The Ruskin Museum at Meersbrook is now an accomplished fact. It has been publicly opened by the Earl of Carlisle in the presence of the Mayor and a strong contingent of Ruskinites from a distance. Up at Walkley the Museum was practically inaccessible to the bulk of our population. The further end of that remote suburb dips into one of the wild valleys leading up into the moorlands of South Yorkshire. The Walkley Museum being placed at this point was thus on the road to nowhere. An air of peaceful repose—highly conducive to the study of the beautiful had there been any students—reigned between its walls. All this will be changed. The tramcars to Heeley will drop their passengers almost at the gates of the park, and the unique collection of the St. George's Guild will thus have a chance of fulfilling its mission.

The silver key with which the noble Earl opened the Museum is a fine specimen of Sheffield workmanship. It also was produced at the manufactory of Messrs. Round and Son, and is an exceedingly elaborate and beautiful work of art. On the obverse of the bow are the arms of the Earl, and on the reverse those of the borough of Sheffield with Mr. Ruskin's motto, "To-day," and down the stem "Ruskin Museum."

On the evening of the day upon which the Earl of Carlisle opened the Ruskin Museum he distributed the prizes to the successful students of the School of Art at the Mappin Art Galleries in Weston Park. Time was when the Sheffield school stood head-and-shoulders above all similar institutions in the country. A process of levelling up, however, has been going on since then; and although we cannot be said to have deteriorated we have yet lost our position of relative supremacy. The work of the successful competitors this year fully maintains its character for excellence—a remark which is especially applicable to the designs for silversmiths' work exhibited on the walls.

It is to be hoped that the promoters—or rather promoter—of the movement in favour of the abolition of the plate duties is satisfied with the result of his exceedingly artificial agitation. Ostensibly aimed at the plate duties, the movement really contemplated the abolition of compulsory Hall-marking. What real silversmiths think of it may be gathered from the memorial sent from Sheffield to the Chancellor of the Exchequer. The result is that compulsory Hall-marking is not to be interfered with, so that a confiding public will still have something more than its own credulity to trust to when it goes to buy its spoons and forks. Whatever may be the views taken elsewhere, there can be no doubt at all about the position taken up by the Sheffield silversmiths in relation to this matter. We have suffered too much from false marking, and done too much to put a stop to it, to offer any facilities for its practice in a business which has hitherto been happily free from it.

Nevertheless Mr. Wotherston indulges in a shout of triumph as obviously artificial as his so-called agitation. Nobody knows better than Mr. Wotherston that the Sheffield manufacturers have all along expressed themselves as utterly indifferent to the retention or abolition of the plate duties, or that they have, on the other hand, been determinedly hostile to the abolition of compulsory Hall-marking. If Mr. Wotherston thinks he has scored a success let us be thankful that he is so easily satisfied. We can afford to let him indulge himself in a prophetic forecast as to what is to happen next year. I don't suppose the members of Her Majesty's Government know or care much about the matter, but of this we may be sure, no Government can afford to quarrel with the Cutlers' Company for the sake of appeasing Mr. Wotherston.

To the question, "How is business?" the invariable reply just now is, "Oh, there's no push, but otherwise there is nothing to complain about; we are fairly well employed." This sounds like damning the situation with faint praise, and there can be no doubt that the action of those unwise people who did not know when they were well off is beginning to tell. The silver trade, like every other trade in this country, will always fluctuate in sympathy with the iron trade, and therefore the fall in the price of iron can never be indifferent to us. In spite of all this I hear no complaints, and considering the inherent propensity of Englishmen to grumble this must go for a great deal. While I write this the news comes that the price of engine slack is reduced. This may not, after all, be an indication that the tide is on the ebb, but only that we are returning to a more healthy state of things.

The Duty on Gold and Silver Plate.

CONTINUING his Budget speech Mr. Goschen said:—And, now, the first serious inroad I propose to make on my surplus is the remission of the duty upon gold and silver plate. That is a change which, I believe, is expected. I will not conceal from myself that it is not pleasant for a Chancellor of the Exchequer to part with a tax which is paid with the greatest possible cheerfulness by those who are liable to it. There is a positive alacrity on the part of members of the trade to pay the duty. They are protesting in advance, I may frankly state to the committee, against the abolition of this duty. I must, therefore, make out some case why we propose the abolition. The first shake was given by the report of the committee of 1878-9, of which I was a member. That committee recommended that whenever the condition of the revenue would permit, the duty on silver plate should be abolished. The committee was moved to make that recommendation by a consideration of the unequal incidence of the duty. The Indian community fastened on this suggestion of the committee, attaching, as I think, undue importance to the abolition of the duty. Still, the fact remains they do attach enormous importance to it. They consider it would affect the price of silver, and enable them to send more manufactured silver into this country. They are sanguine, I think, in their expectations. It might be contended that in a matter of this kind we should not regard the interest of India, but British interest only; but that argument has been rather cut away by the recollection of the imposition of the cotton duties, which in the Indian view were in British interests, and against Indian interests; and the Indian community claim that in return in this matter of the plate duty we should consider Indian interests. This claim has been pressed upon various Chancellors of the Exchequer. It was recommended by a Royal Commission recently, and in the face of repeated recommendations it is difficult to resist the pressure, though, as I say, the repeal of the duty is opposed by silversmiths in this country. The right hon. gentleman the member for Midlothian handled the subject in 1881, and proposed to reduce the duty gradually, and would have proposed an immediate reduction, but he shrank from the amount of drawback, which at that time would have amounted to £170,000. The right hon. gentleman subsequently withdrew his proposal, but he reverted to it again in the following year, and from that time this matter has been in a state of suspense, and, to use the right hon. gentleman's words, "The state in which it has been left perplexes the market, embarrasses trade, and discourages industry." With all these declarations before us, I wished last year to adopt the recommendation of the Royal Commission, but I had no means to meet the loss of revenue and the heavy drawback. By what has occurred I think we are practically bound to take up the subject and deal with it. Viceroys and ex-Viceroys attach the greatest importance to the matter, and there would be serious disappointment in India if, now that we have the opportunity, we should not follow the advice of high authorities and repeal the duty. On gold articles the amount realised is small. The committee will be amused to learn that the great amount of duty levied on gold plate is paid upon wedding rings—£23,000 of duty on gold plate comes from the duty paid on this most necessary article of social life. I propose no provision for drawback in the case of gold plate. As regards silver plate I anticipate the amount of drawback at £120,000, which I add to £80,000 which we lose by the abolition of the gold and silver plate duty. I know the drawback used to be estimated at £170,000; but uncertainty, I understand, has prevented accumulation of stock, and I feel convinced that £120,000 will be sufficient. I do not propose to pay off any amount of drawback that may be claimed—I take £120,000 as the maximum—and I hope that arrangements may be made with the trade (and these shall be stated in detail later) for paying off the duty on stock on hand, provided they have not passed into use. With the co-operation of the trade I anticipate the amount will not exceed £120,000. The Royal Commission on Gold and Silver Plate stated that we should not pay more than the year's drawback, and the sum of £120,000 is about two years' drawback upon silver plate, because the duty upon it amounts to £60,000.

Silver.

OUR prediction that silver and silver securities were likely to rise in consequence of the proposed silver legislation in the United States, says a contemporary, has been amply fulfilled. Bar silver has gone up nearly 2d., and Rupee 4½ per cent. paper has been "boomed" to something like 76, or a rise of 3½ per cent. It seems more certain than ever that Congress means to carry some measure this session with a view to increasing the usage of silver as a medium of currency. In point of fact the Senate and the Lower House have agreed on all points except one, namely, the kind of money in which silver certificates are to be redeemed. The House wishes to restrict redemption to silver alone, but the Senate proposes to redeem either in silver, gold, or greenbacks, a proposal which is nothing short of folly. In the end some compromise will in all probability be arrived at, for it is not to be supposed that the Silver Party will be so foolish as to leave the substance whilst grasping at a shadow. It is important to recollect that this silver legislation is being backed not only by the Silver Party but also by the Inflationists, whose numbers are formidable. It is popular, too, with the general public, and especially with the public in the Western States. Dearer silver not only means more profit to the mines, but more exports of wheat as a result of Indian exports being very seriously damaged. If the proposals now made become law, the purchases of silver by the United States Treasury will reach 4,500,000 dols. a month, or more than double the present amounts. Whether the population of the United States is capable of absorbing all this additional currency without depreciating the value of the silver certificate, and whether a sharp rise in the value of silver will not stimulate the opening of fresh mines and also sales of the metal by the German Government, are grave questions, the discussion of which the limits of our space compel us to defer.

Silver-Plate.

IN the course of an article under the above heading, the *Spectator* says that though plate may be esteemed a luxury, it is opposed to all sound financial principle that an exceedingly heavy duty—more than 35 per cent. on the market value of silver—upon a manufactured article should be retained one minute longer than is indispensable to the Treasury. We have to think of the manufacturer as well as the consumer; and as regards the manufacturer, this duty, which grows perpetually heavier as the price of silver descends, is absolutely indefensible. We may be keeping ten thousand workmen, for what we know, out of a gainful and innocent employment. It is, moreover, of consequence in the present state of the metal markets, to increase the demand for silver, a rise of even a penny an ounce relieving our Indian fellow-subjects of a taxation which must be, of all existing forms of taxation, the most exasperating. An Indian might bear to see a million or two spent annually upon an object of which he disapproved, for, after all, that is an incident inseparable from foreign rule; but to see a million or two spent so as to produce nothing, to see it, as it were, vanish into vapour under the name of "loss by exchange," must be aggravating in the highest degree. We do not doubt, either, that the removal of the duty will increase the use of silver, possibly to an unexpected extent. Experience shows that whenever you remove a tax upon a manufactured article, you remove an incubus upon whose weight nobody had exactly calculated, and develop a demand which nobody had exactly foreseen. The duty just stopped people from doing something which, the moment it was taken off, they discovered was the very thing they wanted to do. This was the case, we believe, in a most curious degree, with the glass trade, the removal of the duty leading to the discovery, first, that glass could be used in a hundred unanticipated ways, and, secondly, that poorish people by the ten thousand had been doing without glass—for example, for greenhouses—rather than pay its price. The consumption at once increased immensely, and so, we doubt not, will the consumption of silver in the arts. It is inevitable that it should be so, if there is any truth in the laws of supply and demand.

And yet, though we write so absolutely, we must confess that our conviction is a true instance of economic faith, and rests upon no evidence whatever. We cannot, after considerable pains, find a single article which ought to be made of silver, and at the same time would be made of silver if the duty were removed. The abolition of the duty will not make plate cheap enough for the use of any large new class, while its removal will neither abolish nor extend the true and unperceived limits to the consumption of silver. These are not so much its price as its liability to oxidisation, and the difficulty, amounting sometimes to an impossibility, of defending it against thieves. If silver were like gold, almost beyond the effect of atmosphere even when impregnated with the effluvium of gas, it would be used even now by the wealthy in a far greater variety of ways. Boxes, money-boxes, for instance, and boxes for jewels, would be made of it; drawer-handles, where beauty was required; the frames of mirrors, the tops of little tables, the frames of good clocks, the handles of fireirons, the frames of instruments like aneroids, and, above all, what are called the "finger-plates" upon doors made of valuable wood. Even fireplaces might be covered with it—an enormous source of consumption—and we are not sure that we might not add some varieties of jugs, and a great variety of trays. Silver, however, rusts in the atmosphere of cities, and rusts in such a way that it can only be cleaned by an amount of labour which even in large houses is embarrassing, and in small houses is impossible to procure. You pay, as it is, a sort of rent for your silver, and if you have much, you pay not only a money-rent, but a rent in the worry of keeping more servants than you positively want. It takes time even to clean the table articles properly, and to clean entire suites of silver—frames, handles, finger-plates, chandeliers, and the like—would demand a substantial increase in the establishments where such articles were made of such a metal. It is *repoussé* silver-work which is required, and *repoussé* silver-work, besides wearing off its fine edges under incessant friction, requires an attention which drives even experienced men-servants into unbearable tempers, or, what is even worse, into the secret use of those mercurial powders which eat silver as sand-spray eats glass. It is possible, we know, that science may one day remove this objection, the makers of bicycles having already gone a long way towards that end. Those exceedingly clever and exceedingly jealous craftsmen found out very speedily that the kind of man who uses an expensive bicycle wants his wheel always to look bright, does not want to pay perpetually for cleaning it, and utterly abhors the monotonous labour of cleaning it himself. They therefore, with great ingenuity, electro-plated their wheels with nickel, a metal which gets "greasy" but does not rust, and then painted the nickel with silicon, a transparent liquid *nearly* as hard as metal. Unfortunately, it is not *quite* as hard, or the problem would be solved. The chemists do not, however, despair: and if they ever give us a "water" varnish which will not crack or chip, or give way under heat any more than silver, they will, we venture to predict, double the consumption of silver in well-to-do houses for decorative purposes. That, however, will be their triumph, not Mr. Goschen's; and until they have triumphed, this obstacle to a full demand for silver will remain as immovable as ever.

The second obstacle is worse, for it is one with which even the limitless resources of science can never hope to deal. Silver goes to be stolen too readily. It is a valuable article even at 3s. 6d. an ounce. It can be melted out of recognition in ten minutes in the most ordinary of crucibles, and it is the permanent object of attraction to all thieves, however common. They rather dread bank-notes; they cannot get at bonds; they never see gold about, except in houses which are too well protected; they are perplexed about jewels; but a haul of silver in unoccupied rooms attracts them as valerian attracts cats. They know its value to an ounce; they know exactly where to dispose of it, and to get it they will run risks which seem to decent people incredible,—the whole class of area sneaks, for example, living in hope of silver. This attractiveness of the metal to the dishonest cannot, that we see, be cured, except possibly by a severity which modern ideas will not tolerate; and it interferes with the consumption of silver in every possible way. But for it, silver would take the place of electro-plate in ten thousand households, the buyers being quite content to invest their money in that way, if only it is safe, but resolutely set against purchases the value of which they may lose at unexpected moments. Mr. Goschen, we imagine, would be surprised if he knew, as the great manufacturers of electro-plate know, how comically intense this feeling is, or how very "comfortable" are the families which habitually yield to it. It is of no use whatever to tell them that £100 does not signify to them, or that their women's jewels are worth the plate-chest five times over; they simply will not lose their silver, and habitually take precautions about it which they never think of taking about diamond necklets. They know their silver is watched, and chuckle over electro-plate, which, were the silver only safe, they would regard as barbarous. This is, we are convinced, the grand check upon the consumption of silver for household purposes, for it not only prevents the accumulation of silver articles by the comparatively rich, but it deters the poor from using silver as their material for hoarding. "Hoarding?" says some one; "hoarding is extinct in Great Britain; there is no hoarding." On the contrary, there is a great deal of hoarding, and always must be. All the poor are not improvident by a long way, and those among them who save, especially women, have a great liking for articles which are worth money, which can be turned into money with certainty and at once, but which are not money, and which therefore are not borrowed, and are not spent on drink, or, indeed, spent at all, except with deliberation. There are thousands of poor houses in Great Britain which in good years are choked with furniture, not one piece of which is ever used, or would ever be bought by its purchaser if he did not look on it as a resource against a future rainy day. The natural investment for a saving man who will not keep coined money, knowing that he should spend it, is articles of silver; but he does not buy them, because they are almost as difficult to protect as coin itself. An Asiatic does buy them. first, because he hates articles of uncertain value, and secondly, because he can protect them against anything except murder—which is rare even in Asia—by heaping them upon his wife and children, sometimes in such profusion that they can hardly walk. That would not suit an English poor man's ideas at all, and he therefore, instead of buying articles of silver, which he could pawn in five minutes for a fixed amount, but could not easily protect, buys all kinds of articles which he does not want, and which cannot be pledged half so readily. Taking off the duty will not dispose of this difficulty at all, any more than it will of the difficulty created by oxidisation; and we are puzzled, therefore, to know where the new demand is to come from.

It will come: we are certain of that, from economic faith, not reason; and we will venture on a conjecture or two as to the manner in which it will arrive. Only three of the ways of which we can think seem to us very probable. One is, that a reduction made in the cost price of the article will just suffice to make it tempting to a class which at present hesitates to buy, and which is exceedingly extensive. We do not see a particle of evidence for that proposition, but it is possibly true, and if it is true, there is the problem solved at once, mainly at the expense of the electro-plater. Silver will replace his ware in humbler houses than at present, as it does already to a small extent in the single article of light spoons, and sometimes teapots, about which there is an unacknowledged but traditional sentiment of personal dignity. Or the reduction may, by quickening competition between the real thing and the imitation, induce the electro-plater to lower prices, until entire ranges of articles shall be plated which are now left bare. Or, finally, and this is the most probable of all, an immense series of plate articles may be made in inferior silver, upon which the duty now presses with prohibitory weight. We do not profess to know this part of the subject accurately; but we have heard that, but for the duty, silver could be lowered in value, as gold is lowered by certain alloys, without losing any of the essential and, so to speak, inherent qualities of silver, except the single one of value. That this has been done—honestly done, we mean—in the case of gold, we all know, half the utility of the nobler metal in the arts being, in fact, the utility of nine-carat gold; and if it can be done to the same extent with silver, it is in that direction that consumption will, in all human probability, increase to an almost indefinite degree. Articles really of silver, with a definite though low value, and indestructible, would amazingly attract classes which outnumber the well-to-do almost as much as the electors outnumber the payers of income-tax. "Cheap silver" would, we think, sell; and if it would and can be produced, our economic faith, which is sure to be justified somehow, will be justified in that very commonplace and inartistic way.

Assaying and Marking Gold and Silver Goods Abroad.

AN important Parliamentary paper has just been presented to Parliament giving detailed information on the following points:—The general rule adopted abroad as to assaying and marking gold and silver goods. What standard prevails? Is the quality of the goods presented for marking ascertained by the "touch," or by the "scrape," or "parting" assay? Is any practice similar to English hall-marking compulsory, and, if so, are export goods exempt? What are the regulations relating to the exposure for sale of foreign goods? Finally, what duties are payable on imported goods? These questions were addressed to British Consuls abroad by the Prime Minister, and the replies are embodied in the report referred to.

Newly-made gold and silver goods offered for sale in Austria must not be below the legal standard, and must be provided with the name of the maker, or his trade mark. They must also be tested at the assaying office and marked accordingly. The unit of weight is one pound of 500 grammes. The legal standard is, for home-made gold wares: No. 1, 920 thousandths; No. 2, 840 thousandths; No. 3, 750 thousandths; No. 4, 850 thousandths. For silver made wares: No. 1, 950 thousandths; No. 2, 900 thousandths; No. 3, 800 thousandths; No. 4, 750 thousandths.

The fineness of the metal is ascertained by the touch-needle or touch-stone. Hall-marking is compulsory, except in the case of goods for exportation. Foreign goods imported into Austria are subjected to the assay, with the exception of surgical, physical and mathematical instruments, medals, enamelled goods, simple settings of jewels, and goods of which the gold does not weigh more than 40 ass., or the silver not more than 60 ass., and gold and silver objects imported as personal luggage. Three florins in gold per kilogramme import duty is levied on gold and silver wares, twelve florins in paper money for every pound of gold, and one-and-a-half florins for every pound of silver, for assay fee. In Hungary, articles are assayed by scraping, although the assay by fire is frequently used. On silver the moist assay is employed whenever required. Marking only applies to gold, copper, and silver. Marking is obligatory; exported goods are not marked; the imported goods may be sold as freely as home-made articles, but must pass a Customs examination. In Belgium, only silver table plate is, as a rule, presented for assay and marking. The touch-needle is used for ascertaining the quality of small articles, and the fire test for knives and large pieces of plate. A new law will come into force in Denmark in 1893; there is no standard as to gold, and the silver standard is 826 per cent. For testing purposes a small piece is clipped off the ware before it is finished; when this is impossible the scraper is used. There is no hall-mark in France, but all wares must be warranted to be up to the standards established by statute, and must have the mark of the maker. Previous to 1884, no goldsmiths' wares were produced in France at a higher standard than 750 thousandths of gold to 250 thousandths of alloy; but subsequent to that date lower degrees of fineness were allowed; they were, however, confined entirely to goods declared for exportation, and the sale of the export goods was prohibited in France under heavy penalties. It had, indeed, been the purpose originally to apply the standard of 583 thousandths only to watch cases made for exportation, which were not to be exported at a lower standard than that of 583 thousandths. The law, however, now declares that jewellers and others may manufacture goods for export at any standard. The mark for watch and clock ware is confined to watch cases imported. Three tests are used, namely, cupellation, touch, and the hurried assay. In the case of silver assayed by cupellation, the weight of the piece to be tested being previously ascertained, a particle of lead is fused with the silver in the cup, the lead becomes oxidised, carrying off all alloys, leaving the silver pure. The difference between the weight of the original and the remnant determines the standard. In the third process the alloy is dissolved in nitric acid, and the silver is found as a precipitate by the use of solutions of chloride of sodium. According to the liquid consumed, the weight of silver is calculated, and the standard determined.

No gold or silver ware can be bought or sold in France without a standard mark and payment of the duty called *Droit de garantie*; but gold and silver ware of all standards may be exported free of duty in this way, that a drawback of the whole amount is given either to makers exporting new goods produced in France and marked of the requisite standard, or to merchants re-exporting from France products previously imported under international treaties, and subject to the same control as French gold and silver ware. No manufactured wares of gold and silver can be exposed for sale in France in any place without being previously impressed with the standard marks of the State which indicate their nature and fineness. Merchants and export houses trading in gold or silver ware of any standard, or makers dealing with customers abroad, have to make a declaration of their intention so to trade, both to the prefecture of the department and to the mairie of the commune. All merchants and exporters are subject to the supervision of the excise, and have to keep the necessary balances, etc., for the use of the inspectors. As it is forbidden, as before stated, to deliver for home consumption any gold or silver wares of which the law of 1884 only authorises the manufacture for exportation, such ware, if discovered in possession of persons who have omitted to make a declaration, is liable to seizure, and the makers or possessors liable to prosecution and fine.

In any shop where watch cases, or gold and silver ware for export are kept, they must be placed in distinct cases marked legibly with the words—"Exportation gold watch cases of the fourth standard," and then "Exportation gold and silver ware of all standards." The law which regulates the whole question of gold and silver standards is, as that of November 9, 1797, and according to clause 23 of that law, gold and silver wares entering France must be declared at the frontier, weighed, leaded, and so forwarded to the assay office, where they are marked and charged with duty equal to that levied upon similar goods manufactured in France. Ambassadors and envoys are the only persons exempt, also travellers' luggage up to five hectograms. Independently of these two taxes, the tariff levies the following duties upon imported wares, viz:—

	General Tariff.	Conventional Tariff.
Wares of gold and silver, platina, and other precious metals	500 francs per 100 kilos.	500 francs per 100 kilos.
Gilt or silvered ware, viz., false jewellery	500 francs per 100 kilos.	500 francs per 100 kilos.
Other	100 francs per 100 kilos.	100 francs per 100 kilos.
Gold watch cases ...	4 francs 50 apiece.	3 francs 50 apiece.
Silver watch cases ...	1 franc 50 apiece.	1 franc 50 apiece.

In Germany, Govermental supervision is exercised over gold and silver goods. Manufacturers are empowered themselves to assay and mark these wares in their own establishments, and are responsible for the correct attestation of the standards, there being no official certification of the standards specified. The stamp denotes the manufacturing firm and the standard registered in thousandths. Gold and silver may be manufactured and sold up to any standard. Gold plate can only be stamped when containing 583 thousandths or more, and silver plate when containing 800 thousandths or more of pure metal. The actual standard may not differ more than 5 thousandths for gold and 8 thousandths for silver below the standard specified. This does not apply to gold and silver jewellery or ornaments, which may be stamped so as to show every thousandth part of pure metal. The "scrape" or "parting" assay is used. There is no compulsory practice similar to English hall-marking. Imported gold and silver wares, whose standard is denoted in a different manner from those recognised by this law, may only be offered for sale when they bear a stamp in accordance with the above-mentioned conditions. A kilogramme of imported ware is subject to a duty of six marks—practically six shillings.

As regards Italy, trade in gold and silver wares is free, and Government offices for assaying purposes, either manufactured or in bars, exist only in the principal cities, and are only for the marking with the Government stamp of articles proved to be of the following qualities, viz:—gold of the quality of 900 thousandths, 750 thousandths, and 500 thousandths; silver of the quality of 950 thousandths, 900 thousandths, and 800 thousandths.

Assaying large articles of gold is done by scrape in the cupel by means of nitric acid at 22 degrees or 32 degrees of the areometer of Baumé. In large silver articles the test is either with the cupel or by liquid examination by the Gay-Lussac method; in large quantities of silver the latter way is preferred, it being more exact than by cupellation. In cases of minute articles of gold or silver the assay is made by means of the touch-stone. Imported articles may be freely exposed for sale, and are only subject to a Customs duty of about 11s. 2d. per hectogramme on gold plate and jewellery; of 7s. 2d. per kilogramme on large articles of silver or silver gilt; on small articles of similar manufacture, the duty is about 8s. per kilog.

In the Netherlands, a duty amounting to 15 florins per hectogramme of gold, and 75 florins per hectogramme of silver, is levied on all gold and silver articles, of the proportion of 250 thousandths parts or higher, manufactured in that country or imported. All articles have to be stamped at one of the offices appointed for that purpose. Articles below the above-named standard are not accounted as gold or silver ware. The assay for small articles is by the touch, or, in doubtful cases, by a chemical process ; for large gold articles, by fire ; large silver articles by the test of moisture. In large articles, projections must be left for the assayer's purpose, but he can make an incision if necessary. In the goldsmith's shop stamped and unstamped goods must be kept separate. The import duties amount to 5 per cent. *ad valorem*, in addition to other special duties.

In Portugal, gold and silver wares must be marked by the manufacturer and at the assay office, the latter guaranteeing the standard. There is no institution in Portugal corresponding exactly to the Goldsmiths' Company, but a compulsory system of marking wares intended for sale exists, and no articles capable of being marked are exempt. There are two standards for articles intended for trade in the country, and several inferior ones for goods intended for exportation. The whole question is being examined by a committee appointed in 1887, but it appears that should any changes be made they will refer more to details than principle. The whole duty of guaranteeing and fiscally superintending the manufacture and trade in gold and silver bars and manufactured articles rests with the Mint. Assay offices were originally created at Lisbon and Oporto, and an additional one has since been added at Braga. An assayer must prove his competence and cannot be engaged in trade. The export of wares of any standard not less than ·333 as regards gold, and ·800 as regards silver is permitted ; but they must be marked at one of the assay offices indicating their proper standard, or, if not possible, they must have an equivalent certificate. The standard value is always expressed in thousandths, such denominations as "carats," etc., being abolished. Articles made in the country or in the adjacent islands for sale in Portugal must belong to one of the following standards :—gold, 916·66 thousandths or 833 ; the prevailing English standards being equivalent to 925 thousandths. The lowest standard for articles intended for exportation is :—gold ornaments, 333, and in the case of silver, 800. The permitted variation in bars or wares of gold is two per thousand if the standard has been ascertained by the royal or chemical assay, and may be increased to five per thousand if ascertained by the "ensaio visual." The royal or chemical assay corresponds to the test by the cupel, and the "ensaio visual" is similar to the assay by touch. The permitted variation for solder in gold articles has been raised to twenty per thousand for hollow objects, and thirty per thousand in objects made of filigree. In silver articles two per thousand is allowed, if ascertained by the chemical test, and ten per thousand if determined by the "touch" method. Two sorts of punches are employed for marking purposes :—first, those of exact guarantee ; second, those of approximate guarantee. Punches for marking goods for exportation bear a royal crown, with the Arabic numerals, 3 up to 14, indicating the following standards : 800 for silver wares ; 700, 710, 670, 630, 583, 540, 500, 458, 417, 375, 333, for gold wares. Plated goods are marked P.L.

The chemical assay consists in melting down certain portions of metal in a crucible or cupel made of bone ashes, and testing the button or piece resulting from this process by nitric acid, in the manner known in England as the test by the cupel. In assaying certain classes of goods, scrapings from the principal piece or from the accessories are substituted. The director of the Lisbon Assay Office describes the systems of assaying silver wares as follows :—The ensaio visual method, which corresponds to the assay by touch, consists in rubbing the article with a special stone (the Lydian stone), which is sometimes an unpolished onyx, and comparing the mark with another made with a needle or bar of silver of the legal standard. The greater or less whiteness or smoothness of the mark made on the article shows its relative superiority or inferiority to that obtained by the bar or needle of the legal standard. This system is extremely untrustworthy, and is used exclusively for the verification of articles presented singly, or which, on account of their being already completed, cannot undergo the chemical assay without deterioration. The latter system has been already mentioned, and is always applied wherever possible. All hollow wares presented in lots, *i.e.*, of the same pattern, are invariably assayed by this process, the assay being made on the "button" produced by the melting of one of the articles taken at random ; it is also applied to spoons, forks, handles, waiters, trays, and similar articles ; of course, the makers send them before being finished off. The method employed by the official assayers for the chemical process is the Gay-Lussac (mentioned in the earlier part of this article, with the modifications introduced by Staas. It is based upon the total precipitation, by means of chloride of sodium (common salt), of a soluble salt of silver in the state of chloride of silver, but completely insoluble. The method therefore consists of two principal processes, viz. :—first, the dissolution of the silver to be assayed in nitric acid, and thus obtaining azotate of silver, which is a soluble salt ; secondly, the precipitation of this salt by means of chloride of sodium, thus obtaining chloride of silver, which is an insoluble salt. To carry out the assay a dissolution of common salt, exactly measured so that 100 cubic centimetres shall precipitate one gramme of silver, must be prepared beforehand, *i.e.*, in such a manner that if 100 cubic centimetres of a dissolution of common salt are mixed up in a flask with one gramme of silver dissolved in nitric acid, there must not be separately either any salt or any silver, but only chloride of silver. After obtaining this result it is necessary to keep it protected from the atmosphere to prevent evaporation, which would concentrate it, and from the variations of temperature, which would reduce its strength. It should therefore be kept in a closed vessel. There must also be the greatest care in measuring the liquid necessary for assaying, so that it may be taken in exactly the same quantities as that in which the measurement took place, because the least error leads to quite erroneous results. The "Staas" tube is recommended for accuracy, and is a modification of the original Gay-Lussac. It is almost impossible to make a mistake with this, because the tube is filled to the top, whereas in the Gay-Lussac it is only filled to a certain point or gauge. The tube is kept in a vertical position by proper supports, and is filled from the lower part by means of an india-rubber tube. Having done this, it is necessary to know how much silver alloy should be taken in order that this alloy may contain the gramme of pure silver which it is wished to precipitate. If the legal alloy is 833 thousandths parts ; that is to say, as we have in each gramme of silver alloy ·833 of pure silver, it will be ascertained by means of the following proportion, viz., 833 : 1 : : 1,000 : 1·200, that in 1·200 grammes of silver alloy there is one gramme of pure silver. It is, therefore, this weight, 1·200 grammes of alloy which must be taken in order to ascertain whether it contains one gramme of pure silver, because 1·2 : 1 : : 1 : 833 (1·2 of alloyed silver is to 1 of pure silver as 1 of alloyed silver is to ·833 of fine silver). Weighing, therefore, 1·200 of the silver to be assayed, it is dissolved in nitric acid, to which is added 100 cubic centimetres of a solution of salt. The bottle is violently shaken until the liquid is transparent, and the precipitated matter at the bottom. If the alloy is of the legal standard, the liquid is not precipitated any further by the later addition of silver or salt. If it is precipitated by the addition of silver it shows that there was a deficiency of that metal, and the alloy is inferior ; if it precipitates by the addition of salt, it shows that there was an excess of silver, and the alloy is superior to the legal standard. All imported goods are subject to the laws operative against native wares. The Customs duties on manufactured gold and silver articles are : on articles made of gold, £7 1s. 4d.; on silver goods, £2 8s. 8d. per kilogramme, 2·204 H s. A jeweller in Portugal has to keep in a conspicuous place in his shop a printed copy of the laws on legal standards, and also a copy of the principal marks, and to give purchasers bills with the description, standard, and origin of the goods supplied.

In Russia, native wares, as well as imported goods, are sent for assay to one of the local officers; on each zolotnik (equalling 2·408 drachms) of alloy of gold 15 copecks are levied, and one copeck on each zolotnik of silver alloy. Very small articles are exempt, and also surgical and metallic instruments, settings for artificial teeth, and gold and silver watches. The following are the established standards:—For gold wares, 56, 72, 82, 92, and 99; for silver wares, 84, 88, and 91; gold and silver wire, from 94 to 96; for gold-beaten articles, from 87 to 96. The scrape form of assay is generally adopted, although when this is not possible the touchstone is used. For silver ware in ingots, Gay-Lussac's and Folgardt's methods are used.

Gold and silver wares exported have to be hall-marked, but the makers receive a drawback of half of the hall-marking tax on the export. All such articles circulating in the trade and imported must be of the legal standard and marked; ingots of gold and silver are not subject to compulsory marking. An import duty of 43 roubles 55 copecks in gold currency per lb. of gold wares, and *R* 2·90 copecks in gold per lb. of silver wares is imposed.

In Spain, the scraping and wet processes are employed for assaying. As regards standard, silver articles of more than one ounce must be of the standard of 916 millims; not exceeding one ounce, of 750 millims. For gold, heavy articles, such as dinner services, must be of the standard of 22 carats, or 916 millims; small articles, such as brooches, of 18 carats, or 750 millims. The Customs duties are—for gold, silver, and platina in ornaments or jewellery, per hectogramme, £1. Silver in ornaments or jewellery, per hectogramme, 2s. 9½d.; gold, silver, or platina worked in other articles pay 2s. It is not obligatory to have the official assayer's stamp on articles of gold or silver sold or imported into Spain.

In Sweden, gold and silver goods of home manufacture are, as a rule, marked in Stockholm at a place similar to the English Goldsmiths' Hall. According to law, gold goods should have five marks—(1) the hall-mark; (2) the goldsmith's mark; (3) that of the town in which it is sold; (4) the letter of the year; (5) the carat. Silver articles need only have the first four marks. The legal standards are for gold (*a*) 23 carats, 23 carats and 5 grains; (*b*) 20 carats, 20 carats 4 grains, 20 carats 2 grains; (*c*) 18 carats, 18 carats 4 grains, 18 carats 2 grains. The silver legal standard is—13 lod 4½ grains (=828·1 thousandth fine silver). All goods offered for sale in Sweden have to be marked unless they are too small, when the seller has to be responsible that they are not below the right standard. Foreign goods pay a duty of (for gold) 11 kronas, 70 öre per kilogramme, and for silver of 7 kronas per kilogramme.

The general conditions for Norway are similar to those applying to Sweden. Marking is not obligatory when the weight of the article in gold does not exceed 75 grains, or for silver, 75 grains; nor can gold articles be sold of a fineness under 0·75 if weighing 45 grains or more, while silver goods cannot be sold if the fineness is less than 0·850. The assay is accomplished in the way best adapted for the purpose. Gold or silver in nuggets are free; when polished or in any way prepared the duty is 64 öre per kilogramme. There is a question of revising the law on this subject.

In Switzerland, gold and silver watch cases have to be assayed and marked with the federal stamp; in other cases the control is facultative. The standards are:—Gold, 18 carats and upwards; gold, 14 carats and upwards. For silver, 875 mill. and upwards, and 800 mill. and upwards. The "touch" system of assay is used for fragile goods. The import duty is:—Watch cases, gold or silver, 16 francs per 100 kilogrammes; jewellery, gold or silver, 30 francs per 100 kilogrammes.

Finally, there is an absence of marking in America or any system of guaranteeing the standard of gold and silver goods, either for export or domestic use. Nor are there any laws governing the sale of foreign-made gold and silver wares. With respect to Customs duties, manufactured goods, wholly or partly gold or silver, pay 43 per cent. *ad valorem*; jewellery, 25 per cent. *ad valorem*. In 1857 Messrs. Tiffany and Co., of New York, initiated the manufacture of sterling silver ware under their own guarantee, and their example has been so generally followed that the name of a manufacturer stamped on his goods is generally considered sufficient. The amount of silver ware now made in the States less than the English standard is so small as to be unworthy of consideration.

Jewellery in 1890.

WRITING in the *Queen*, "M. B. M." says: Attention has of late been directed in a multidude of ways to modern jewellery, English and foreign, Western and Oriental; their respective qualities, both as to material, taste, and manufacture, have been freely discussed, and amidst all the discussion no question has ever arisen as to the *universal* demand which exists for a plentiful supply of these adornments.

At a recent meeting at Birmingham a prominent M.P. commented upon the character of our English jewellery at considerable length, more especially upon the recognised fact that, whilst the articles produced by our English firms have a world-wide reputation as being first in quality as to workmanship and solidity, our artificers are far behind many others in artistic design and result.

To remedy this it would appear that something, at least, is being done by way of educating the workmen in the principles and practice of art, by which means it is hoped, in course of time, they may be able to compete in this respect also, with success, with every other nation. And if as a nation we cannot lay claim to possessing the genius of art in these matters, such as we find existing in countries like Italy and France; still, there is no reason why English workmen should not be able, with their unrivalled resources, to excel those of any other country, when once their eyes are educated up to the high standard of art which is now brought within their reach, and be able, of the material committed to them, to create and fashion the most beautiful objects of which it is capable.

It is impossible to sympathise with the sneer with which some of the contemporary press have met the idea of artistic jewellery becoming commonly appreciated amongst us. It may be that the same workmen has to produce for "the lady and for her waiting maid;" but I fail to see that this handicaps him, as suggested, in his rivalry with the past. Nor is there reason to suppose that all the relics of antique jewellery which are ever and anon coming to the light have been worn only by royalty or by ladies of distinction. Many are, undoubtedly, from the tombs and buried treasure houses of kings; but there is much evidence to show that in olden times, as now, the "waiting maid," as well as her mistress, wore jewellery; that every class of society had its ornaments, of more or of less value it may be. Did not the Israelitish women "borrow everyone of her neighbour jewels of silver and jewels of gold?" an act which would surely have created strange suspicion amongst the Egyptians, had the custom of wearing them been unusual.

There is another aspect of modern jewellery which can only be touched upon here, though it is one of much interest, the manufacture of imitation jewellery. Of the clever imitations now produced one daily sees more and more in use. Remarking, last week, to a young friend who was showing me her beautiful and costly engaged ring, a certain advertisement, offering the like thing in imitation stones and gold for about 1s. 6d. "Oh yes," she said, "I know, hundreds of girls buy them; but then, of course, the diamonds do not sparkle, in a very short time the gilt wears off, and you can always see they are not real." This testimony of an intelligent girl, moving in good society, and blessed with ample means, reveals the fact that the use of imitations is by no means confined to the "waiting maid" or the lower ranks of life. Young girls, even in the higher grades of society, have not the means of buying costly jewellery; but, in the womanly love of adornment, they obtain those within their reach; but let all such girls have a care that such ornaments are beautiful in design and of creditable workmanship.

Banquet of the Worshipful Company of Clockmakers.

AT the invitation of the Master, Wardens, and Court of the Worshipful Company of Clockmakers, between fifty and sixty gentlemen dined together last month at the Albion Tavern, Mr. Deputy S. Elliott Atkins (Master) in the chair.

After an excellent repast, and the usual loyal toasts had been honoured with customary enthusiasm,

The Chairman proposed the toast of the "Army, Navy, and Reserve Forces," and in doing so said he was hardly one of those who agreed with the late Lord Mayor's action in appealing to the country to provide the volunteers with a proper equipment, because he thought that if the youth and manhood of England gave their time and service, it was the duty of the Government to see that they were properly equipped.

Major Joseph, who responded, expressed views diametrically opposed to the foregoing. With considerable enthusiasm he advocated the doctrine that volunteer officers should maintain the efficiency of their regiments, arguing that the volunteers would be more likely to look up to their officers who had to put their hands into their pockets than they would do if their regiment were maintained by the charity of the nation.

"The Houses of Parliament" was next proposed by Mr. E. J. Thompson, who warmly defended the hereditary principle of the House of Lords.

Alderman Sir R. Fowler, Bart., M.P., was most cordially welcomed on rising to respond. At the outset he addressed a few congratulatory remarks to the chairman, observing that they were looking forward to the time when Mr. Atkins would have completed his twenty-fifth year as Deputy. The Company of Clockmakers, he added, had reason to be proud of being represented by such an honoured City man as their present Master. The hon. baronet then proceeded to speak of the many distinguished men who had been connected, either personally or by their ancestors, with the City of London. He believed that the present Prime Minister counted two Lord Mayors among his ancestors, and there were many other members of the House of Lords whose families had occupied honourable positions in the City, and who, probably, owed much of their present eminence to those positions.

"The Lord Mayor and the Corporation" was the toast next proposed, this duty being discharged with commendable pointedness by Mr. G. W. Adams, who very aptly described the members of the Corporation as members of the City Parliament —men who regulated the City, and where, he asked, was there a city equal to London, either in regard to its wealth, its commerce, or its integrity?

In responding, Mr. C. T. Harris eulogised the present occupant of the civic chair, and said that they looked forward with considerable interest and confidence to the future Lord Mayor, who was a Past Master of the Company, and one whose name stood high in their esteem. He referred to their friend Mr. Alderman Savory. Speaking of the "silent" members of the Corporation, he reminded his hearers that some of the best work was done in committees, and therefore it was unfair to judge of a member's usefulness simply by prolixity of speech.

The Rev. H. L. Nelthropp, M.A. (Renter Warden), remarked, in proposing "The Visitors," coupled with the name of Mr. G. J. Suckling, that the visitors were the jewels which imparted brilliancy to an entertainment.

Sir R. N. Fowler being obliged to leave, the toast of "The Chairman" was proposed by Mr. Hyde Clarke, who gave an interesting account of the Master's long connection with the company, together with the useful services both he and his father before him had rendered in promoting its prosperity. It had been mainly owing to Mr. Atkins that the revenues of the company had been replenished so as to permit of charities being dispensed to the poorer members. To the same gentleman was to be traced the success that had attended the efforts towards establishing their library and museum. Considerable enthusiasm was evoked by the speaker observing that the Master celebrated his eighty-fourth birthday on the previous day, the applause being renewed with great heartiness when the hope was expressed that he might be spared to his friends for many years to come.

The Chairman, responding, said that his first experience of the Company of Clockmakers was when he was an apprentice boy seventy-one years ago. So long as health and strength was vouchsafed to him, and he was able to discharge any duties in connection with their company, it would be his privilege and great pleasure to do all he could to further its interests.

The other toasts were: "The Wardens," proposed by the Chairman, coupled with the name of Mr. Daniel Clarke (Senior Warden); "The Livery," proposed by Mr. W. Lawley, coupled with the name of the Astronomer Royal (Mr. W. H. M. Christie, F.R.S., F.R.A.S.); and "The Past Masters," proposed by the Chairman, and responded to by Mr. G. Adams. A similar compliment was also paid to the clerk (Mr. H. C. Overall).

At intervals during the evening selections of vocal music were performed under the direction of Mr. Seymour Smith, by Miss Laura Brown, Miss Annie Wilson, Mr. J. H. Mullerhausen, and Mr. Sackville Evans.

The Art of Practical Design for Jewellers and Silversmiths.

PERHAPS of all the questions that are to the front to-day in connection with the jewellers' and silversmiths' handicraft, is that of practical design; I use the word "practical" with an intention. We have had a number of designers, so-called, in the trade, who have been merely draughtsmen, the result being an amount of work that when put into the hands of the manufacturer has been found almost impossible to produce, and has in most cases lost all its character in making up. This is only to be avoided by training the workman into the art of designing while learning his trade. The new proposed Technical and Art School will no doubt prove beneficial in giving this assistance; but as only young workmen resident in Birmingham will be able to avail themselves of it, and as there are a number of others in various parts of the country who are not within reach of the schools of art and workshops such as we have in Birmingham, perhaps a few words in explanation, by "one who has served," will be useful, and I hope prove acceptable also, to buyers, as anything which may assist the wholesale purchaser in forming a true opinion as to what is good artistic work must also help to encourage the increase of sales of the same and thus give a strong impetus to art work.

That the practical designer has received very scant remuneration and encouragement at the hands of the trade hitherto is an indisputable fact, and this will have to be altered, in the first place, to give the proper impetus to the art student, or he is sure to drift off into other trades where a designer is a recognised adjunct to the working staff and is paid as well as other artists; you can't get high-class work out of a designer on *starvation wages*.

The misunderstanding as to what ornamental art should be arises in a great measure from the want of study on the part of those who purchase, or patronise and criticise industrial works, and from the careless way in which it is practised by professors of the same.

Of those who talk much and very positively about Applied Art, a great number of them have never commenced by seriously studying the subject, and acknowledge no principles beyond their individual fancy, saying that they can "tell a good piece of work when they see it," etc., etc.; consequently a jumbling together of samples of historic ornament and absurd combinations of purely natural forms without regard to principles, such as fitness or adaptation, frequently pass off as design and must always end more or less in degradation. Thus we get such absurdities as tennis bats with sprays of natural foliage wandering across them, straw hats filled with flowers, and similar devices, passed off as *design* in brooches, when, in fact, there is no design about them, but only a weak copying of articles of use which were never intended for decoration, and only ends in childish results.

What we want impressed upon the mind of the designer in the first place is this : that the article of utility, whatever it may be, must be so formed as to put its *use* before ornament ; then, for the sake of pleasing the eye, begin to adorn it with lovely forms, but in such a manner as not to hide its original purpose. If this is borne in mind constantly, we shall soon begin to lose some of the absurdities of the present day, and a more refined and purer style will be the result. What we want is an original style worthy the designation of nineteenth-century art. In order to arrive at this we must not confound good taste with fashion. Fine art has nothing in common with fashion : it is the eternal fitness of things ; *the right thing* in *the right place*, a fact which fashion often overlooks ; fashion is only a game at follow-the-leader, and the leaders are seldom chosen for the merit which they may possess.

The object of this paper will be to try to shew what the sphere and character of design should be—in what respect it differs from that of the pictorial artist, and also of the fashion-plate, In the first place, ornamental art or design, generally speaking, means the "application of art to some distinct purpose, and the adornment of articles of every-day utility."

This, of course, needs some qualification, because the mere addition of artistic renderings of some natural forms will not in the truest sense constitute good design ; there is a something, a very important something, to be considered as to the method by which the said forms may be applied. Although both must go to nature for their studies, yet their is and must always be a great difference in the method of application used by the pictorial artist and the designer ; it is the aim of the decorator to typify and not to represent nature literally, and in this abstraction lies all the difference between good and bad work. We must go to nature for our designs in order to be original, or we shall find ourselves merely copying and twisting about the work of our predecessors and contemporaries ; it will be necessary to become intimately acquainted with the historic styles and examples such as are to be found in Owen Jones' *Grammar of Ornament* and similar works, for by this means we shall be able to better comprehend what is meant by conventional delineation and see how it is employed. If we study these examples thoughtfully we shall be able to trace the natural sources from which a great part of the forms have been derived ; and then, having mastered this point, we can go to Nature for fresh outlines, and thus produce something not only true but perhaps perfectly new, this last point being the constant aim of the modern jeweller. It will be possible to produce something new because Nature presents an endless variety of aspects of which the mind only takes in a part at a time, and it is in seizing on this and rendering it according to the peculiar bent of the artist's mind that true originality consists. The study of Nature must not be carried on simply for the purpose of copying her forms, but with the further intention of discovering her principles, which are contained in all her varied and lovely works.

It follows then that we must, as designers, have love of Nature, and take a delight in all her works no less than the landscape artist ; but in a somewhat different manner, for while the painter may be best employed with masses of light and shade and colour, we must be examining detail and structure and the fitness of things, for the law of fitness imposes upon us certain limitations in our work that do not affect the landscape artist. We have to take into account the material in which our work is to be produced, for the mere drawing of the design is only a means to an end in our case, and we must be sure and not be tempted to make the work to look pretty merely on paper ; we must be sure of being able to retain the same character when producing it in gold or silver, as the case may be, or it will be a failure in stock, and disappointment will be the inevitable result. Thus the designer must be well acquainted with all the processes of manufacture, and if he is capable of making up his own designs the results will be all the more satisfactory, as it will be an easy matter to put the pattern into the hands of an ordinary good workman, who will produce quantities much quicker and of course cheaper if he has the fac-simile before him of what is wanted. Thus we see that the designer and art workman should be able to execute in *repoussee* work or carving, such as surface modelling, or in filigree, or saw-piercing any design he may wish to make intelligent to the workman, and I think that this will probably be the aim of the Jewellers' and Silversmiths' Art School. These are the means that were obliged to be used by the old goldsmiths and bronzists, such as Benvenuto Cellini, and others, simply from necessity, and now that we are divided up into sections, of "mounters," "setters," "chasers," "engravers," etc., we are in a fair way to lose sight of *bonâ-fide* art work, unless the rising generation awake to the fact and make a study of something else besides the evening newspaper and the blowpipe. Of course, in all studies there are two ways of procedure, the wrong one and the right one, and it is in the hope that it will give some assistance into the right path that this paper will be continued next month.

A. OSBORNE.

The Diamond Trade of Hatton Garden.

THE following article from a contemporary gives an interesting view of the subject from an outside aspect :—

This historic part is well known to have been one of the most fruitful spots in London in days of old; but, like most places in the great city, is now nothing but bricks, mortar and "mammon." Hatton Garden has been for many years the resort of the diamond and jewel trade. On Holborn Viaduct, close by, will be found a few of the dealers, some of them being leading men ; but the bulk of the merchants belong in Hatton Garden proper, which street they almost monopolise. Here also will be found sundry and manifold share brokers ; for the Hatton Gardenites are, as a rule, great ones to have a finger in any likely "spec.," especially if it be a mine ; in fact, they are a great power in the London share market.

Let me describe the "Garden." A long, straight street, stretching almost due north and south, from Holborn Circus to Clerkenwell Road ; the houses seem to be about half a century old, although some are certainly twice that age. The street is well paved with asphalte, whilst overhead are innumerable telephone wires, chiefly private ones to City stockbrokers.

A chance passer-by, perhaps, would notice but little in Hatton Garden worthy of thought : the small groups of merchants and brokers do not seem any different to those one sees in Mincing Lane or Throgmorton Street, save that they are mostly foreigners (Dutch predominating) and Hebrews.

On one day of each week, generally Monday or Tuesday, the South African mail is distributed in London. Then the "Amsterdammer" appears on the scene, having made his passage across the North Sea on purpose to buy these little pebbles he calls diamonds. Paris also sends a small contingent of buyers, as do Antwerp and one or two other of the large cities. Mynheer Jan van Duyk makes his toilet at a hotel or friendly office, and is ready for business. Ready, I said ? Well, sometimes. For it occasionally happens that a winter fog keeps the boat outside Queenboro' for six or eight hours ; thus, instead of Mynheer Jan arriving in town by eight o'clock, he may not be in till three or four in the afternoon. Let us assume, however, that he has arrived safe and sound in limb and temper ; he goes to the office of his broker, who gives him information as regards the kind of goods expected in the market, "Jagersfontein," "Bultfontein" or "Kimberley," as the case may be. I may remark *en passant* that the goods arrive through one of the African banks, an advance of 75 per cent. of the real value being paid by the bank to the shipper at the Cape, this amount having to be repaid to the London office before the goods are handed to the consignee.

This little arrangement, for which a small charge is made, obviates the necessity of a shipper being out of pocket for his outlay until remittances would arrive from London, the double voyage occupying six weeks.

Mynheer Jan is now busy at the importer's office; if his broker is a man of any influence his client has got what is much valued —a "first sight" of the goods. Bargaining may go on for four or five hours and perhaps result in nothing. But if things are satisfactory out walks the conquering hero with £10,000 or £20,000 value in his undercoat pockets. The goods are walked off to the broker's office, where they are sometimes re-arranged in their different packets; they are kept in peculiarly-folded papers having a sort of glazed interior.

Then the merchant gathers up his belongings, secures the little packets about his person, and starts by the 8.30 p.m. train from Holborn Viaduct to Queenboro', where he embarks for Flushing. By midday following he is in Amsterdam, and his purchases are given out to the market. In the meantime his broker in London has paid for the goods (if bought for cash); the broker's presence at the purchase having acted as a guarantee of payment to the vendor. Of course, brokers receive varying fees; the usual remuneration is one per cent. from each party on the net amount of the purchase.

So much for the trade in "rough." Polished diamonds are, of course, dealt with every day, whilst rough are almost confined to "mail-day" transactions. This trade naturally requires great practice; each stone must be examined and judged separately, for one inferior diamond may make a purchase an utter failure. How it has been cut, whether "antique" or "modern," will greatly influence the value of a brilliant; while a tinge of yellow in a stone may reduce its value 30 per cent. Thus the best of light is required for the business; on foggy days Hatton Garden is workless.

The cut stones are chiefly sold to the large dealers in the "Garden," who in turn send them to Paris or the other Continental towns. The Continent also gives a great deal of return business. America takes a quantity of cut stones, the great New York firms each sending their buyer to London. The Americans chiefly buy on credit, paying in six months' time, so that they get their goods without being at a loss if they cannot at once realise a good sale.

With the immense values which some men have to keep on their premises, great precautions must, of course, be taken. The very best safes are used, and most of the leading firms have their goods behind about ten inches of iron and steel. The favourite form is a double safe, the outer one being packed to resist fire, whilst the inner one is of the strongest steel, against which a burglar would very probably dash his brains out in despair at getting through it. The locks are made like claws; as soon as the safe is locked there is not a scrap of possibility of forcing the door open by leverage. In this I refer to the modern improved safes, which are almost exclusively used.

These precautions are very necessary, for the thief of to-day has been watching for years for a good haul. He refreshed himself with the Hatton Garden Post Office robbery in 1881; the gas was turned off at the meter suddenly, just after five p.m. (when the last Continental registered mail goes out), and the registered letter-bag stolen. Never a word has been heard of the thieves, for all had been so cleverly planned that they got clean away before even those in the office realised that anything was wrong. In 1885, a Mr. Alexander, at 16, Hatton Garden, was half murdered with a life-preserver (save the mark !) and £4,000 worth of goods taken. This dreadful affair caused the erection by another firm of a sort of iron cage, just inside their office door. Strangers can enter the door, but the cage, reaching from the ceiling to the floor, prevents further ingress. Conversation can be well carried on; but unless the cage-gate be unlocked to him, no person can enter the office.

In 1889 roguery proved again a match for the Hatton Gardenites. A person made his appearance, and, by dint of good references, obtained goods to the amount of about £9,000. He is now living in seclusion in Spain. And last we have the recent case in which a postman was assaulted and robbed of mails, the poor fellow being chloroformed to ensure his silence during the outrage. Goods lost are never expected to be seen again; the stones are quite marketable, as it is impossible to particularise any single one. Any jewellery stolen is unset, the metal going to the crucible and the stones to Antwerp or to Italy.

It may be mentioned that the diamond trade has just reached a severe crisis. The rough market has been for some months under the control of a very large company, the De Beer's Consolidated Mines. This company was once far smaller, and possessed a rival, the Kimberley Central Diamond Company. These two companies consolidated, and this, of course, gave a great rise to the price of diamonds, as there were no longer two interests fighting each other, but one combination.

Since then the company has either bought up or obtained perpetual leases over nearly every other concern at the Cape; now it produces or controls the production of 90 per cent. of the diamonds produced there. The market has accordingly been run up tremendously, from an average price of 17s. per carat eighteen months ago to 40s. to-day. But now has come the question, Will merchants buy at the enhanced prices? And there has been such a strong refusal to buy from the majority of merchants that the price has been reduced by about three shillings. This gave the great company's shares a shock, for they fell from £22 to £17 within a couple of days. And Hatton Garden asks, How is it all going to end?

The Burmah Ruby Mines.

SIR LEPEL GRIFFIN'S visit to the Burmah Ruby Mines will cause considerable interest, says the correspondent of a contemporary, to be taken in the different modes of working them, especially as he is understood to have declared that, in his opinion, the expensive and elaborate hydraulic methods of Californian mining are unsuited to them. It will serve a useful purpose to describe the modes of working these mines before the present company took them over, and, fortunately for this purpose, there exists the most authentic and copious information, based on official surveys and reports. This is not surprising, as the Indian Government, on annexing Upper Burmah, was naturally extremely anxious to ascertain the precise value of the ruby mines, which had formed a considerable portion of the revenue of the Kings of Ava and Mandalay.

The ruby mines, as at present defined, may be considered as limited to the four valleys of Mogok, Say Boo, Kathey, and Kyatpyen; and, although they cover a nominal extent of fifty square miles (ten by five), the well-defined areas where ruby mines are known to have been actually worked are included in a total space of less than five square miles. The remaining space, although not worked in the past, is, however, considered likely to prove not less prolific of rubies in the future than that part which has been already exploited by the natives. Although they might be further subdivided, there were two principal modes of native mining—one adapted to the plains, and the other to the hillsides. In the former the byon, or ruby earth, lies at a depth of from three to twenty feet; and in the latter the operations of the natives have been restricted to the clay in the fissures of the rocks. Fortunately, these mining operations can be carried on to the most advantage at different seasons of the year, the dry season being the most favourable for working the byon in the plain, and the wet, when water is more abundant, for acting on the lodes in the rocks. At the same time it may be observed that working on the lodes can be carried on during the wet season with little or no interruption. Experience has shown, strangely enough, that, while common stones are abundant in the byon, the larger and more valuable have generally been discovered, under greater engineering difficulties, in the lodes. These have only been worked by the natives in the soft clay which fills up the fissures of the rocks, and one of the first suggestions made for the improved working of the mines was to establish a way, or working, through the rocks in proximity to some formerly productive fissure. Should a profitable lode be reached, it would be easy to sink the necessary shafts, or establish drifts. For these operations only the simplest appliances, in the shape of drills, jumpers, and dynamite work by hand labour, would be requisite. With sufficient water power, which is rarely deficient, compressed-air machinery and diamond drills can be used. In one important point the native workmen were extremely deficient and behind the time. They neither understood nor could they supply artificial ventilation, and a large number of mines have evidently been abandoned, not because they are exhausted, but because the miners were stopped by accumulations of carbonic acid or oxide gases.

In working the byon in the plain of the valleys, it is most essential that the supply of water should be copious, continuous, and well regulated. Under native management the supply was provided in open aqueducts, and these are, of course, antiquated, and will have to give place to wrought or cast iron pipes. On the supply of water depends the substitution of true hydraulic mining for the crude systems hitherto in use among the Burmese. The success of the mining operations in the past has arisen from their simplicity, and, probably, it will not be very different in the future. In dealing with the byon in the valley, very likely no mode will work better, or prove more remunerative, than the total removal of the crust of earth covering the byon, and then carrying the byon itself to the washing-house; and this operation might be continued over successive plots, until every inch of ruby-bearing gravel had been extracted. This mode of working the byon applies evidently to that which is nearest the surface. Much of the byon lies at a depth which can only be made accessible by regular mining operations; but it is desirable, from every point of view, that the productiveness of these mines should be made evident without any avoidable delay; and for that reason, if for no other, the simplest and most economical—in the sense of certainty of result, as well as cheapness of cost—procedure should find favour.

Gemming and Mining Company of Ceylon.

What has been Done since the Formation of the Company, and the Prospect.

THE statutory general meeting of the shareholders of the Gemming and Mining Company of Ceylon, Limited, was held on April 10 at the offices, Gresham House, Old Broad Street, Mr. Thomas Dickson (the chairman of the company) presiding. The Secretary (Mr. J. Jameson Truran) having read the notice convening the meeting,

The Chairman said: Gentlemen, you have had the notice convening the meeting, which is held in accordance with the Joint Stock Companies' Act, by which, within four months of the formation of a company, a meeting shall be held. There are no accounts to be presented, but I think it will be acceptable to the shareholders if I make a few remarks on the position of the company. The company was formed on December 16 last, and we went to allotment on the 20th of the same month. The number of shares subscribed for was 24,456; and these shares are £2 each, which shows a subscribed capital of £48,912. Out of this sum the directors reserved £20,000 for working expenses, as provided in the prospectus. We at once sent out instructions to Ceylon to proceed with the business of the company in the shape of the transfer of the land and the completion of the leases. These advices would arrive about the end of January, and legal matters move comparatively slowly in the East. It was a little while, therefore, until we got ourselves in order, but on March 31, which is no great delay, considering all things, the transfers were made, the leases were signed and in order, and the company obtained possession of the properties. Our last information by telegram from our agents in Ceylon was to the effect that the company's business is now in full swing. Having thus given the state of the company's position as regards its property and finances, I will now proceed to give you a short account of the property which we have acquired. As to the management in Ceylon, we think that we stand in one of the best possible positions. The Ceylon board are people who are well known in the colony. Two of them are Cingalese gentlemen of good standing, well known in the island, and thoroughly acquainted with mining for gems and plumbago. I need say nothing more regarding Messrs. Delmege, Reid and Co., who are our agents, as they stand as bankers and merchants of the first rank there. Then, again, as to the management of the business at home, you have on your board of directors gentlemen who have spent the best part of their lives in Ceylon, who are thoroughly acquainted with the island, and how the business is conducted there, and who will give their best attention to the development of the company's property and the furtherance of its enterprise. Then as to the kind of property that we have acquired, and its probable value as a gemming and mining enterprise, the prospectus sets forth very fully what we concluded the property was capable of doing. But since that time we took advantage—or the board in Ceylon did—of the presence of a mining expert already well known in the island, and who as a practical miner has been employed in South Africa and in the mines of California and Australia. This mining engineer, Mr. Baddeley, was authorised to examine and report upon our properties. I may say that when a mining expert or captain is asked to report on a property after it has been acquired, it stands to reason that he will give a more correct report probably than what he would if it were to be put in a prospectus to catch the public eye. Before the issue of the company, this report of Mr. Baddeley was carefully gone into; it is now in type, it will be issued to all the shareholders, and I commend it to your close attention as a very useful document, showing the nature of the land that we have inspected on the spot, and giving his reasons for what he considers will be eventually the success of the company. A few words may, perhaps, be mentioned as to what has struck the directors in this report of Mr. Baddeley. He there says that, after examining the gem pits of Everton and Aberfoyle, he proceeded to investigate the streams issuing from the forests around them. Everywhere he found the land was very gemniferous; that streams radiated from the land acquired by the company in every direction, but principally down the valleys leading from Everton and Aberfoyle. There a vast quantity of sapphires, rubies, and gems of all descriptions have been mined for, and found, by the natives for untold generations. In fact, he emphatically states, and we thoroughly believe, that this land that we have acquired is the home or cradle of all the deposits of gems in the province of Rakwana, and that what does not come down from the company's land, but is carried away by another stream into the neighbouring estate of Booyatenne, is simply the stones whose homes are in Everton and Aberfoyle. I wish we had the map here, which is now on its way home. It has been drawn up in the Surveyor-General's office, and shows the company's lands and what we have acquired. A short stream is put down by Mr. Baddeley as issuing from the Aberfoyle forest, into which no natives have ever gone, and in which, he states, will be found the matrix or home of all the gems and precious stones that are found in the streams and gravel pits of the province of Rakwana. One of the most extraordinary positions of the property was exemplified in a tremendous precipice from 500ft. to 600ft. high, standing like a wall, over which streams of water and cascades fall, corresponding in an extraordinary degree to a description in the *Voyage of Sinbad the Sailor*. The water-power coming out of the forests and falling from such a height over these tremendous precipices, will be of inestimable value to the company. By this splendid water-power we will be able to do what has never been done before, and what forms the great difficulty in the Transvaal and other centres of mining, viz., to use this water-power for sluicing the clay or gravel obtained from our pits, and thereby proving most useful to the company's workings. I need not mention the splendid water-power which these falls will give, and by which the working of the pits, the hoisting material and other matters will be worked. So far for the gems and the gemming land.

We now come to another and most important portion of the company's enterprise, viz., the mining for plumbago. Ceylon is famous as producing the very finest plumbago in the world; in fact, it is the only place that does produce the finest plumbago. To show you to what an extent this trade has developed itself, I may state that the exports from January to December of 1889 were 465,922 cwt., or double what they were in 1888. This plumbago is of very great value, and is well known as being used extensively for crucibles, while the extensive manufactories for machinery and castings that are now in progress make this plumbago of very great value indeed. Hitherto, the low countries of Ceylon have been the principal places from which this plumbago was extracted, and that entirely by natives. The heavy rains that prevail for five or six months in the year in Ceylon render these flat low-country mines most unworkable, on account of the water. The advantage this company will have in working the plumbago from their own properties is, that the deposits are situated upon the hill-side at an elevation of 1,500 to 2,000 feet above the sea; so that, instead of sinking shafts, it is most probable that our engineers will simply tunnel into the side of the hill and extract the plumbago without the expense attending upon low-country workings. It so happens that within an hour we have received from the docks a sample of the plumbago now being extracted from our mines. It is upon the table, and any shareholder present, or those who wish to come, may inspect the plumbago. You can see it is of the most beautiful silver-lead description, and is worth certainly £15 per ton in Colombo. We are informed that we have most extensive deposits of this same plumbago; and, in fact, the mine is in full operation, in so far as the few coolies employed upon it are working at present. One advantage we will have in working the company's properties is the facility of transport and of easy access to the port of Colombo. Our properties lie within a day-and-a-half's journey from Colombo, upon a good road, and there is a navigable river within a very small distance. Compare this with what is now taking place at the great Burmah Ruby Mines, where machinery ordered from this country is lying upon roads through inaccessible jungles, with great probability of never arriving at those distant mines. The difficulties of working these mines compared with those in Ceylon are very marked. In Ceylon we have excellent labour supplies of the most hard-working and docile description, and will not have to guard our mines with a hundred Ghoorka soldiers as the Burmah Ruby Mines have at present to do. The difficulties presented in working the Burmah Ruby Mines are set forth with extraordinary candour in a leading Burmah newspaper, the *Rangoon Times*. It is there stated how the machinery has to be remodelled again, and at the present time they are working the mines there in such a way that I will read the concluding sentence to you. This is what the *Rangoon Times* says:—"The conditions, we believe, are almost identical with those under which gem-collecting is conducted in Ceylon." I have now to report that we received a telegram yesterday which has given the board a satisfaction which, we think, the shareholders will agree with. It was to the effect that Mr. Baddeley, who had sent the report home, had agreed to take the management of the company's mining operations, and we have no doubt that when we get the letters we will find a very satisfactory arrangement has been made. We have now ready for shipment a gem-washer, which has been prepared under instructions from Mr. Streeter, with such suggestions as occurred to the board, and which enables us to dispense with a considerable amount of manual labour in washing with baskets. To test this gem-washer a considerable quantity of the blue clay and gravel, in which our jems are found, is on its way home, and will be tested in the presence of the board and their friends. Another important product which we hope to find, and, in fact, have found, is mica. I hoped to have seen here Mr. Baker, one of the shareholders who took shares in the company for the very purpose of having this mica investigated and pursued. The prevailing rock throughout Ceylon is gneiss, and Ceylon has already exported a considerable quantity of very fine mica, which is always found prevailing in gneiss rock. We have now one ton of this mica being landed, which was shipped from Ceylon by our friends, and this we shall sell and report further upon. It is worth 6s. a lb., and a sufficient quantity of it cannot be found for the consumption of the country. This cannot be called a mere prospecting company. The gems we are certain are there; the pits and shafts of Everton are 100 feet deep, with galleries radiating from them, and from there and the land surrounding innumerable sapphires and other gems have been taken for ages past. There is no country in the world which can produce sapphires equal to the Ceylon sapphires. We may, therefore, assure ourselves that we have the very home of the sapphire in Ceylon in our lands of Everton and Aberfoyle. Throughout the surrounding forest the finest cat'seyes are found, and these, with the sapphires, rubies, garnets, moonstones, Alexandrites, and other gems will be found in the clay, where they have been washed down from the mountains by denudations through innumerable past centuries. Hitherto the gemming has been confined to the surface of these places in Ceylon where gems prevail, but by deep-sinking we find we will come upon the best strata, where the finest of these gems are. I have thus given you, as well as I can, a short *resumé* of the company's position, and having stated that, I am now prepared to answer any question which any shareholder may wish to put.

Mr. Islan: I should like to ask what the estates and lands are which have been conveyed to the company.

The Chairman: They are fully stated in the prospectus.

Mr. Islan: Is Everton one of them?

The Chairman: That is the principal one.

Mr. Islan: And have they all been conveyed according to Ceylon law?

The Chairman: Quite so. I may further remark that we have on the table some specimens of the gems taken from the Rakwana district, kindly lent me by Mr. Streeter, who knows Ceylon thoroughly, and who has great faith in our enterprise. By these you will see how the ruby and sapphire are mingled together in the same stone, for they are both of the same family. Another stone he has lent us will shew you the ruby in the matrix, and our contention is that when we find the home of these water-worn gems, which are now discovered in the rivers and the gem pits and gravel pits where operations have been continued for so many ages—when we find the home where these have proceeded from, we will then be able to assist nature by pulverising, through the action of fire, the stone that surrounds those precious gems, and arriving at them in very large quantities. These stones did not drop from the clouds; they shew that they have been water-worn, and have come out of our land.

Mr. Islan: From what estate has the plumbago come?

The Chairman: From Barra, the lowest of the estates we have leased.

A cordial vote of thanks to the chairman and directors closed the proceedings.

Gold-Plate Manufacture.—On the 22nd ult., Mr. J. Rowlands asked the Chancellor of the Exchequer whether he was aware that the whole of the trade engaged in the manufacture of gold plate had been at a standstill since he made his Budget statement; and whether he would consider the claim of the manufacturers to a rebate on the stocks in hand.—The Chancellor of the Exchequer: I have received representations that the trade in gold plate has been thrown into some confusion by the proposed abolition of the duties on plate. Some inconvenience is, however, inevitable when an abolition or reduction of duty takes place as regards the articles affected. My attention has been exclusively drawn in respect of the difficulties in which manufacturers or others are placed as regards their duty-paid stocks to the case of wedding rings. As wedding rings have been for years specially exempted from a drawback on exportation, no question of rebate can arise in their case. But it may be worth considering whether an extension of the date for the duty on gold plate to come into operation would not convenience holders of duty-paid stocks.

Edouard Phillips.

We owe to the courtesy of Mons. Caspari, hydrographic engineer of the French marine and secretary of the committee of organisation of the last international Chronometrical Congress, says the *Journal Suisse D'Horlogerie*, the following information concerning the lamented Phillips, who was at once his master and his friend.

Edouard Phillips, born at Paris in 1821, was admitted in 1840 to the Polytechnic School, from whence he came out in the first rank to enter the *corps des mines*. His works were at first relative to metallurgy. Soon after he took up the questions of applied mechanics ; it is to him we owe a learned and ingenious theory upon the rails coulisse of Stephenson, and a very important treatise on the springs of railway trains.

In 1858, at Dieppe, he made the acquaintance of Jacob, the well-known watchmaker, who invited him to examine if the calculation could not be made to conduct and determine the form of the terminal curves of the balance springs of marine chronometers, in order to obtain the concentric action. It was resolving this problem that made his reputation in the horological world, and established besides the conditions of perfect isochronism. His capital memoir upon the subject, presented in 1860 to the Academy of Sciences, is inserted in the *Recueil des travaux des savants étrangers*, and in the *Annales des mines* ; it constitutes a condensed practical manual which all horologists should know. His essentially clear mind is perceptible ; after having treated a subject by the highest methods of mathematical analysis, he is only satisfied when he succeeds to express his results under a form geometrically simple and easy to seize.

In 1862, Mons. A. L. Berthoud suggested to Jacob the idea of requesting Phillips to study the singularity presented in the positional adjustment, as the changing of the rate when a certain amplitude of arcs is passed. Phillips acceded to this request, and treated the subject in a very complete manner in a new memoir presented to the Academy (*Comptes rendus*, Feb. 8 and 22, 1864).

Named Professor of Mechanics to the Polytechnic School in place of Bour, he distinguished himself in his instruction by a remarkable clearness and a perfect method ; he held less to shine in his transcendant theories than to inculcate his auditors with the spirit of the mechanic, by teaching them the general methods applicable to all problems, and he succeeded perfectly. Soon after he was elected member of the Academy of Sciences.

On August 31, 1868, he presented to the Academy a memoir upon the influence of the elasticity of the bi-metallic rim of the balance upon isochronism, showing that the deformation due to centrifugal force produced an acceleration of the short arcs when applied with isochronal springs.

In 1871 he visited Switzerland. At Locle he communicated to many artists, notably to Mons. J. Grossmann, an idea relative to the application of second interior curve to the flat spring) *Comptes rendus*, March 9, 1874). But he awaited the results of the experiments before giving the theory of this improvement (*Comptes rendus*, January 7, 1878), and the results obtained were at all points superior.

In 1879 he extended these results to the spherical spring (*Comptes rendus*, June 9 and 16, 1879). A further memoir, inserted in the journal of the Polytechnic School (xlix. Book, 1881), resumed these studies, and the extension of his theory to springs of various forms, conical, double-conical, flat, spherical, helical, to which the same curves were equally applied.

The works of d'Yvon Villarceau had not produced practical results. M. Phillips attacked the question by a more general method, and arrived at results more complete and more applicable. Such was the origin of the memoirs (*Comptes rendus*, March 8, 15 and 22, 1880), in which he studied the influence of the form of laminæ, and of the nature of the metals which compose the regulator.

From 1869, he had applied his theory, and the determination of the co-efficients of elasticity, and of the limits of elasticity, by noting the duration of oscillation of a single balance with springs of various materials (*Annales des mines* tome xv., 1869). Mons. Caspari having drawn his attention to the influence of the mass of the spring upon the duration of the oscillations, he modified his method by operating in a static fashion (*Comptes rendus*," Feb. 17, 1879).

Let us quote again a memoir of thermo-dynamics : Determination of the specific heat at constant pressure, at constant volume, and of the characteristic function (*Comptes rendus*, May 27 and June 3, 1878).

Phillips had, these last years, exchanged his chair of mechanics at the Polytechnic School for the charge of examiner *de sortie*. He was also Professor of Mechanics at the School of Mines of Saint-Etienne, and at the central school of Paris. He was Inspector-General of Mines, Doctor of Sciences, and Member of the Institute.

The essential traits of his character were kindness and benevolence ; he knew no enemy. He excelled at encouraging the young and guiding them in their work.

As savant, he possessed the profoundest theories of mechanics and mathematical analysis. But he never wished to advance any theory whatever, however indisputable it appeared to him, before having it minutely and completely verified by experiment ; no one was so strict as he upon the quality of these proofs. His works upon the compensation were pushed far beyond what the published memoirs indicate ; he had prosecuted with Mons. Callier experiments of a high interest, notably upon the flat-rimmed balance ; but would have nothing published, awaiting always a more complete result.

So, in this last case, he prosecuted at the Paris Observatory some experiments upon the isochronism of the pendulum applied as a regulator. His death, which nothing made foreseen so suddenly, has interrupted these works before he could say anything to the Academy, and notwithstanding that success was already accomplished.

At the exhibition of 1889, were collected in a group the principal French mechanical inventions. Alone among living inventors, under correction, M. Phillips figured for his springs, as much for application to horology as for physical instruments, for the precise measure of co-efficients of elasticity. He has presided at two of the Exhibition Congresses ; that of chronometry and that of applied mechanics. He was devoted body and soul with the scrupulous conscience, one could almost call exaggerated, which he put into everything he did. He neither grudged his time, his pains, nor his care, pre-occupying himself with details and directing the discussions with an amenity, a courtesy, and a finesse incomparable. The sole reproach that could be made against him—and this reproach is a eulogy—was that of being too modest, and at a time when it is received that each should push himself forward, of not having enough to say of himself. This is without doubt the reason for which he was only an officer of the Legion of Honour, when others of not equal merit are commanders or Grand Officers. It is also for this that this great and learned man is little known to the great public ; but he did not care for the suffrages of the crowd, and the approbation of those who know how to appreciate his superiority will suffice him. It is one more reason for us, that we should render a public homage to the memory of a man with whom the qualities of the heart and character were as great as was his scientific attainments.

The recent discovery by a New England chemist of a cheap method of dissolving zinc by combining it with hydrogen is regarded as a most valuable one. The product is a solution called zinc-water, and has the property of making wood to which it has been applied absolutely fire-proof, and at a very low cost.

A beautiful silver-gilt flagon has just been placed in Truro Cathedral, which bears the inscription, " To the glory of God, and to the service of His sanctuary ; the gift of Alexandra, Princess of Wales and Duchess of Cornwall."

Ascertaining Longitude with the Chronometer.

THE necessity of ascertaining the longitude at sea became imperative for European mariners after the discovery of the western hemisphere, and seamen, kosmographers, mathematicians, and astronomers both proposed methods and were diligently studying devices to solve this intricate question ; yet it required centuries until the problem was satisfactorily solved. It may be well said that the best talent of those ages grappled witb the question. An American contemporary passes by the many geodesic, astronomical, and physical (magnetic) methods proposed ; in order to at once commence with the methods intimately connected with the history of horology.

To take a cursory review of the principles underlying the subject. We know that, apparently, the sun passes around the earth once in twenty-four hours, and that therefore every place on the latter has a " noon " or meridian once during this time. Not all the localities of the earth, however, have this noon at the same time ; those lying farther to the west have it later than those more to the east. Let us imagine the equator divided into 360 degrees, and dividing lines drawn from one pole to the other ; through these points we thus obtain the longitudinal lines of the earth, the first of which may be chosen at pleasure : St. Petersburg, Berlin, Greenwich, Paris, Washington, etc. Since, next, the sun passes through all the 360 lines in twenty-four hours, it results that it passes in one hour over fifteen, and a locality lying either to the east or west upon the fifteenth line (or, as it is more properly called, " degree ") of longitude, will have its noon one hour earlier or later, so that when it is twelve o'clock or M. at the former place, it is only eleven at the latter. The principle is so very simple that a child can readily understand it.

This being premised, it is easy to determine from the difference of time the longitudinal difference of two localities. Let us suppose, for instance, that a timepiece, regulated according to Greenwich time, and which continues going with precision, is carried to a certain place at sea, the local time of which is 5 h. p.m. ; our Greenwich timepiece, however, gives us 2 h., and we then know that the ship is distant from Greenwich 3 h. = 45°. While, next, the more eastern locality has its noon earlier than the more western, we can easily ascertain whether the former's time is a.m. or p.m.

The history of the timepiece or chronometer and the various propositions made and methods previously used, belongs to the most interesting part of horology and has been ably treated by Prof. Eugene Gulcich, in his " History of Horology." He says that the first very valuable work, entitled : " Of the Longitudes," was written by Alonzo de Santa Cruz, and was dedicated to King Philipp II. This author spoke of six different methods of determining the longitude. In spite of all research, not a copy of the book can be found anywhere, and for this reason it is not known who proposed the present system of dividing the equator into sixty equal parts, or hour lines. The Spanish chroniclers believe that the book was written between the years 1520 and 1530. As time measurers, Santa Cruz proposed hour glasses, clepsydras, wheelwork actuated by weight, and even lamp wicks, saturated in oil, which consume very uniformly, when ignited. But it is said that Santa Cruz remarked at the end of his " proposed methods," that it would be very difficult to ascertain the longitude with any fair degree of precision by means of wheelwork.

To judge from various extracts of the work made by the Spanish chroniclers, it is generally believed that Santa Cruz was the author of the present method of determining the longitude. But about the same period, on the 15th of April, 1524, also another very famous kosmographer, the celebrated Don Hernando Colon,[*] a son of Christopher Columbus, delivered a written opinion to the Junta at Badajos (convened for the purpose of determining whether the Spice Islands were Spanish or Portuguese property), in which he reviewed the different methods used for determining longitude. In the collection of all the voyages of discovering of the Spaniards, together with the documents referring thereto, by Narvarrete, vol. iv., various memorials of similar purport by different kosmographers will be found, but Colon is the only one who proposes the obtaining by time. The contents of this method are about as follows in English translation :—

" The longitude might be determined, if one possessed a means, a timepiece, in order to measure the hours and the quarters, together with fractional parts. If this timepiece were set to the time of the place of sailing, then a vessel, which sails to the east or west, could ascertain from the difference of the time abroad (meaning the local time.—Ed.) and the time indicated by the timepiece, the degree of longitude." That the observer, in the calculation of local time, must take into account the sun's declination, the latitude, etc., was also mentioned by Colon.

It is difficult, therefore, to determine whether Colon or Santa Cruz was the originator of this method, although it can be fairly well established by an approximately correct argumentation. In the Junta at Badajoz participated a number of prominent kosmographers of that age, not one of whom, however, made a proposition similar to that of Colon. If Santa Cruz had written his work before 1524, it is presumable that these scientific men had read and known it, and would have referred to it in their several written opinions. But since they did not, it may be concluded that Santa Cruz wrote his book at a later date. Beside these reasons the concluding paragraph of Alonzo, " that it would be advisable not to entertain the idea of determining the longitude by means of a timepiece," sounds more like a criticism of somebody else's method than that of reviewing his own. According to the fashion of those days, and in view of the great importance of a solution of the longitude problem, Alonzo would most certainly have enlarged almost *ad nauseum*, if it had been his own invention, in place of simply " pooh poohing " it. For these reasons Colon may, with a fair degree of probability be credited with being the originator of the idea.

In 1530, Gemma Frisius debated the same method for determining the longitude in his work " De Principiis Astronomial et Cosmographiæ," (Antwerp, 1530). The fact is important that he speaks of mechanical timepieces, by which Gehler believes he meant the Nuremberg " eggs " to be used for the purpose.

Philipp III., who took a great interest in the Spanish marine, promised a reward of 10,000 dols. to anyone who should propose a successful method of determining the longitude. The Dutch States in the beginning of the 17th century, on their part offered a sum of 30,000 Dutch florins for the same purpose.

The proposition of Gemma Fricius called forth the most diligent endeavours of mathematicians and astronomers of all nations, and as early as 1514 the German, Werner, afterwards Orontius Finaüs, proposed the employment of the lunar distances, which had already been mentioned by Apian, in 1495. The reward promised by Philipp III. attracted the greed of swindlers and pretenders of every sort who had until then been engaged in compounding the philosophers' stone, squaring the circle, or trying to devise ways and means for bolstering up the finances of some state. Many of them essayed to solve the problem, although the larger part barely understood the principles involved, and the pitiable royal kosmographers were compelled to at least apparently examine with great care the greatest absurdities, because very often these pretenders had secured the patronage of persons of high rank, whose intervention could not be slighted. The Spanish government disbursed large sums of money without securing the desired results.

Huyghens approached the subject from the horological standpoint. He believed that he might modify the pendulum clock composed by him in such a manner that it might be used at sea. Two such clocks could be placed at different places on board ship, and set according to the local time of the place of embarkation. He wrote a treatise in Dutch on this subject, a Latin translation of which is to be found in the first volume of bis *Reliqua*. The *Philosophical Transactions*, 1665, as well as the works of that inventor, " Horologium oscillatorium," contains the results of a few experiments, instituted with these clocks by a Scotch captain, Holmes. It appears that Holmes, fitted out with two of them, sailed, in company with three other ships, from the west coast of Africa towards the West Indies. At the island St. Thomas he set the clocks and then sailed 700 miles westward. He next returned again east and sailed a few hundred miles in this direction. After a few days, the accompanying ships desired to obtain drinking water, and sought the West Indian Island, Barbadoes, which, according to their reckoning was closest to them. But Holmes found with his clocks that he was about 30 miles from the Fire Island, which indeed was visible next morning. On the occasion of an expedition of the Duke of Beaufort to Candia, the longitude of several points in the Mediterranean was determined with fair precision.

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[*] Colon is the Spanish of the name Columbus.

Finally, however, Huyghens himself came to the conclusion that no progress could be made in this direction, because he constantly sought to correct the evils arising from the use of his pendulum clock at sea.

Leipnitz, the great German philosopher and mathematician, very emphatically recommended the use of watches for the solution of the longitude problem. He advised the construction of watches with two balances, each with a balance spring, and which mutually influenced each other by means of a toothed wheel, in order to ensure a greater uniformity of rate.

The Academy of Sciences of Paris had meanwhile received a fund from Count Meslay for the purpose of giving an annual prize for a useful invention made on the domain of ocean shipping.

In 1720, this prize was offered for the invention of a device for making the rate of a pendulum clock on board ship regular. The offer of this prize, perhaps, caused Sully to bestow his attention upon the pendulum, because in 1729, he submitted to that learned body a pendulum clock for use on shipboard which was provided with a lever escapement. The experiments with it, instituted in Paris, were favourable, but those on board were still wanting. For this purpose Sully went to Bordeaux, and tried the clocks with satisfactory results on board various vessels on the Garonne. The French ship captain, Radouay, however, was not content with these tests, and carried the clocks with him on an ocean voyage. These last results do not appear to have been up to Sully's expectations, because history says that he died from grief over these failures.

Sully was a native Englishman, and pupil of the well-known watchmaker, Gratton. He occupied himself in his younger years with the solution of the longitude problem, and was for some time connected in his labours with Newton, who esteemed him higher. He visited Holland and Austria for this purpose, and in Vienna he found a protector in the person of Prince Eugene, and delivered several discourses to the Academy of Sciences there. Afterwards he went to Paris with the Duke of Aremberg, and became acquainted with Leroy. He gradually managed to ensure for himself the protection of the Duke of Orleans, and was dispatched by him to London to collect watchmakers, and start a watch factory near Paris, of which he became director for a short time subsequently. He soon lost this place, however, and then started a second similar institution in St. Germain, under the protection of Marechal de Noailles. Both the factories did not continue long, partly by reason of political disturbances, and partly for want of money. For the manufacture of his marine clock, Sully received a pension of 600 livres, up to the day of his death, in 1728. He was a highly diligent worker, and contributed much toward developing the art of horology in France.

Another Englishman named Dudlay proposed to use mercury clocks for determining the longitude, and two Germans took great trouble in constructing devices for embodying the proposition. The invention of the practical means for accomplishing the purpose was made by John Harrison, an Englishman, and it is therefore unnecessary to repeat the "oft told tale," beyond giving the preliminary steps which led to the invention. On July 4, 1714, the English Parliament resolved to appoint a Commission to investigate the subject of determining the longitude; among other scientists, Newton, Clarke and Whiston were members. Newton drew up a memorial in which he criticised the several methods both proposed and adopted, pointing out their inconsistencies and defects. He recommended to the Government that a reward be offered for the purpose of instigating artists and other ingenious men to participate in the invention of some means for accomplishing the purpose, and his recommendation was warmly supported by General Stanhope Walpole, the future Earl of Oxford, and accepted without debate. The bill was introduced in the 12th year of the reign of Queen Anne, and entitled, "An Act for providing a public reward for such person or persons as shall discover means for obtaining longitude at sea" This Act contained the provision that a commission composed of professional watchmakers be appointed to test the propositions and investigations delivered to them, and instigated by this offer. The prizes were: £10,000 for the inventor of a method of obtaining longitude within one degree of correctness on a voyage from the West Indies to England; £15,000 if correct within two-thirds of a degree, and £20,000 if correct within one-half degree.

The above recital is substantially the preliminary history of the chromometer; as stated, the detailed account describing the labours of Mr. Harrison, has in various forms been published in these columns, and need not at present be repeated, beyond the statement that John Harrison is the only mechanic entombed in Westminster Abbey. He was born in 1693 and buried in Hampton Churchyard in 1776. The son of a carpenter, he devoted his life to the improvement of timekeepers, and just before his death he received from the Government the tardy ercognition of his services, £20,000, for producing a chronometer that would determine the longitude to half a degree. His timekeeper, which is now at Greenwich Observatory, has a vertical escapement driving a remontoire. It is in a silver case in the shape of a watch-case, and is furnished with a going fusee and compensation curb. Harrison is also credited with the invention of the gridiron pendulum, though there is no doubt that Graham had some years before exposed with compensations pendulums composed of metal rods.

Manufactured Jewels.

IN the long gallery on the top floor of the Museum at Sèvres is a modest-looking glass case about two feet square. It is very likely to escape the notice of casual visitors owing to the more striking objects by which it is surrounded, such as a Chinese pagoda eight feet high, and a little porcelain figure attired in a lace dress most minutely worked. The glass case is divided into compartments, each containing a chemical. There is a blue substance, a red substance, and some dirty white crystals. In the two last compartments are two saucers containing small coloured stones. These stones are genuine sapphires and rubies indistinguishable from the real stones by any chemical test, and only differing from them in the fact that they have been manufactured, not found; or, to use the technical expression, they have been produced synthetically. The other matters in the case are the different substances used in making the precious stones. The rubies, of which there are about a dozen, are small, certainly not larger than a grain of wheat, and very uniform in size. They are in the shape of regular rhomboid crystals, that is four-sided but not rectangular, and apparently flawless; but as they are rough and uncut, it is not easy to detect flaws. The colouring, which, as is the case with all uncut stones, is somewhat dull, might be described as a slaty lake. The sapphires are very much larger, and vary a good deal in size, the smallest being about as big as a pea and the largest rather bigger than a hazel nut, but in crystallisation they are very inferior to the rubies. They approach, it is true, the rhomboid form, but very roughly and with great irregularities. One stone, for instance, has a body almost square with a spur projecting from it, the whole being almost like a saucepan in shape. All the bigger stones show very distinct lines of cleavage, so that they would lose a large part of their weight in cutting. The sapphires are not of the dark blue type, but have a tendency to purple, being almost exactly the shade of the Ceylon stones. The colour would, perhaps, be best described as blue with a red sheen. There is a strong family likeness between the two classes of stones, and one could almost guess from their mere appearance that they had been produced by similar processes. In fact, the base of both rubies and sapphires is the same, and they differ only in colouring matter. That base is silicate of alumina, or in common language, a combination of aluminum and flint. In order to produce rubies the silicate is mixed with bichromate of potash, and the whole is kept at a certain temperature for several hours until the fusion is complete. For sapphires, cupric sulphate, or sulphate of copper, is substituted for the bichromate, but otherwise the process of manufacture is the same. The great difficulty is to obtain regularity of crystallisation. The rubies tend to break up into too small pieces, while the sapphires are very rough and full of flaws. Apart from this the stones are not imitations, but reproductions of the natural jewels, though in France it is illegal to sell them as rubies and sapphires without stating that they are artificial. But even if the sale were legal, it is not likely that they would come into the market in sufficient quantities to depreciate the natural stones, owing to the difficulties above mentioned, which have yet to be overcome.

Clocks and Timepieces.

THE most ancient method of marking the time was probably by sun-dials, which were of many kinds—erect, inclining, parallel, perpendicular, equinoctial, vertical, polar, mural, universal, etc., and which were discovered according to necessity and according to the turn of mind of the peoples who severally hit upon them. We know very little concerning the early sun-dials; and in most instances not even their inventors' names have been transmitted to us. The invention of the concave sun-dial—that kind which was mostly employed in primeval times—is attributed by Vitruvius to Berosus the Chaldæan; that of the convex and horizontal kinds to Aristarchus of Lamos; that of the vertical kind to Scopivas of Syracuse; and that of the kind designed for all latitudes to Theodorus. But we know nothing more, and even this little is not above suspicion, for Vitruvius could only obtain his information by tradition, since the discoveries were made many centuries before his day. Another early method of learning the hours was by means of water clocks or *clepsydræ*, and the invention of these has been ascribed to the Greeks, because the name by which they are known to us is Greek. The honour cannot be given to the Greeks, however, for long before they became a great nation *clepsydræ* were in use in all parts of the East, in Asia, China, India, Chaldea, and Egypt; and, although it cannot be definitely affirmed, it is yet probable that they received them, as they received most of their arts, from the Egyptians, who may have made some such things before the great migration, and who, being an ingenious people, certainly did effect some improvements in their home beside the Nile. It was from Egypt that toothed wheels were first brought by Ctesibius, and applied to *clepsydræ* about the year 145 B.C., the machine before that time consisting either of a vessel which discharged its contents in a given time, or of a tube leading from a water-tank made to supply the vessel continually with water, which dropped into a cistern or basin marked to indicate the quantity calculated to fall in a settled space of time. It has been said that Cæsar found *clepsydræ* among the inhabitants of Britain when he landed on and conquered the island; but this affirmation rests upon an erroneous interpretation of the great conqueror's words, which run—"In the middle of this passage is an island which is called Mona; several smaller islands besides are supposed to be adjacent, concerning which islands some have written that at the winter solstice the night lasts 30 consecutive days. Upon this point we obtained no information by our enquiries; except that by means of *accurate measurements by water* we perceived that the nights were shorter than on the Continent." From this passage it will be seen that Cæsar used his own timepieces in making his experiments on the length of the nights.

At what time and by whom clocks with toothed wheels, crown-wheel 'scapement, and the regulator in form of a cross suspended by a cord with two weights to shift on it when regulating the machine, was invented is matter of pure conjecture. Of the clock of Archimedes we can say little owing to the dearth of particulars respecting it. Cicero makes references more than once to it, but he gives us no information, and is lost in wonder at its skilful construction and its ability to show the motion of the sun, moon, and five planets; and Claudian, who has written some verses upon it, is almost as vague, and accounts, or endeavours to account, for the mechanism in the old way by saying that the motion was effected by some enclosed spirit—a spirit which could not have been composed of anything more aerious or subtle than springs, wheels or pulleys. The Rev. C. W. King, in a paper on the *clepsydra* included in a volume entitled "Early Christian Numismatics" (1873), has conjectured that the so-called clock of Charlemagne was moved by a spring or weights, because Eginhard, a man of considerable education, makes use of the expression "*arte mechanica mirifice compositum*," which Mr. King thinks could hardly have applied to so old-fashioned a contrivance as a water clock. But Father Alexander and the majority of writers adhere to the opinion that the instrument was a *clepsydra*, though wonderfully improved, and for this reason: had it been acted on by a new motive power such as a spring or weight, then there must have been a contracting power in the shape of a balance which certainly did not exist, otherwise it would have been instantly adopted for all timekeepers. Whether the clock of Archimedes went on wheels or not, the secret of its construction was not definitely transmitted, and no other great genius arising to find out the thing anew, men were perforce obliged to put up with the imperfect measurements of the sun dial and the *clepsydra* until the tenth century of the Christian era, when, the hour being ripe, the man arose in the person of the French monk, Gerhert.

"We know no person," says Father Alexander, "more ancient and to whom we can justly attribute the invention of clocks with toothed wheels than to Gerhert. He was born in Auvergne, and was a monk in the Abbey of St. Gerard d'Orillac of the Order of St. Bennet. This abbot sent him to Spain, where he learnt astrology and mathematics, in which he became so great a proficient that, in an age when these sciences were little known, he passed for a magician as well as the Abbot Trithemius. From Spain he came to Rome, and being a man much superior to the times in which he lived, he was there appointed to superintend the monastic studies in the abbacy of Bohio, situated among the Appenines of Liguria; but the low state of his funds compelled him to return to France. The reputation of his learning and uncommon genius induced Adalheron, Archbishop of Rheims, to establish him in the year 970 as rector of the schools there, and as his own private secretary. Gerhert succeeded Adalheron as Archbishop of Rheims in 992, was transferred to the see of Ravenna in 997, and in 999 was made Pope, taking the title of Sylvester II." His great invention, that of the Madgeburg clock, which, to the astonishment of everybody, went by means of weights and wheels, seems to have been perfected before the year 996, and the prevailing feeling of wonder is well, if forcibly, expressed by William Marlot who wrote: "*Admirabile horologium fabricavit per instrumentum diabolica arte inventum.*" According to William of Malmesbury, there was in his time (he died in 1142) to be seen in the church at Rheims "a mechanical clock, which Gerhert had made, and hydraulic organs where the wind, pushed in a wonderful manner by water, made them give *des sons modulés à des flutes d'airain*," from which we may conclude that Gerhert had perfected his invention of clockwork, or at least had brought it into working condition some time prior to the year in which he made the clock most intimately connected with his name.

Gerhert's claim to the invention of clocks proper has been traversed by more than one writer. Hamberger, for instance, in his essay in Rickmann's *History of Inventions*, says that we are indebted to the Saracens for the original application of the idea, though, it may be, Gerhert familiarised the world with it. His reason for this conclusion is that, in the college of Spain, where Gerhert had been instructed, the professors for the most part were Arabians or Saracens, and they it was, says Hamberger, who imparted the principles to the monk. It may be so, and we leave it so, having no means of proving anything for or against; but it is certain that Gerhert was the first to construct a large clock in Europe. It would not be unreasonable to give him the credit of the thing, however, for as Mr. Reid has pointed out already, toothed wheels were known some 1300 years before his day, and for more than 1100 years they had been applied to *clepsydræ*; and it is not beyond the limits of conception that he should have fallen upon the mode of applying wheels to make a clock different from the *clepsydræ*. Or if the celebrated Madgeburg clock was nothing more than a sun-dial, why should Marlot consider it such a wonder, since it is undubitable that sun-dials were in use from the very earliest recorded times? The most formidable argument against it is the allegation that Gerhert made observations on the pole star, as if to obtain a meridian line or to set a sun-dial by. But could he not have made his observations for the purpose of drawing a meridian-line in order to regulate his clock? M.R.D.

(To be continued.)

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

(Continued from page 253).

2.—Will you please advise me on the following case: A girl, aged between 6 and 7, is cross-eyed; when the straight eye is covered the crossed eye becomes straight—

D. vision R. eye$=\frac{20}{30}$ full
" " L. (crossed) $\frac{15}{200}$

accepts up to $+\frac{1}{24}$ with which she sees about as well as without glasses; any higher number makes vision poorer, as near as I can get to it from her statement. What do you think are the chances of her eyes becoming straight by the use of glasses? Her condition has been as at present for three years. F. L.

Answer 2.—I should strongly suspect that the child had hyperopia amounting to $\frac{1}{12}$, of which only $\frac{1}{24}$ is manifest, and the balance is probably latent. For the correction of cross-eyes by convex lenses the entire amount of hyperopia must be corrected. This can only be determined by the use of the ophthalmoscope in the hands of an expert person when the acuteness of vision is not sharp. The entire amount of the hyperopia may also be determined when acuteness of vision is good by thoroughly paralysing the accommodation, by dropping a solution of atropia containing two grains to the half-ounce of water into the straight eye three times daily for two or three days, after which the strongest convex lens which does not make distant vision less distinct represents the entire amount of hyperopia. We then place the same number of convex lens before each eye. This is the method when one eye is always the fixing eye and the other always the squinting eye. In alternating squint, where they fix first with one eye and then with the other, each eye should be tested separately.

3.—Will you kindly answer the following queries briefly, either by enclosed letter or through the columns of *The Circular*, of which I am an interested reader.

We have a patient, age 46, clergyman, who has one eye which he has never used. His vision in the other eye is good. Has never used glasses until lately, when we fitted him with a pair which he uses at home. Objects to wearing glasses constantly.

Vision is as follows:—

Right eye, D. V. $\frac{20}{20}$
Left " " $\frac{20}{200}$ and barely that.
Left eye with $+$ 60 s. $\frown$ — 9 c. ax. 150°$=\frac{15}{30}$

and can see to read ordinary print with a little difficulty.

The pin-hole test shows the retina to be capable of receiving a distinct impression, and the radiating lines, etc., prove the astigmatism accurately corrected with cylinder given.

Right eye accepts $+$ 60 s. for reading, and we prescribed some weeks since for right $+$ 60 s., and the combination given above for left eye.

The questions we desire to ask are these:—

I. Ought our patient to wear glasses constantly, with a plain glass or $+$ 144 over right eye and best obtainable combination for D. V. on left eye?

II. What will be the probable result if he persists in neglecting the left eye?

III. Can he reasonably expect the right eye to continue to do the work of both eyes when presbyopia becomes more advanced?

If you can briefly reply to these queries you will greatly oblige.

I fitted these glasses as a matter of experiment, having recently purchased a test case from Spencer Optical Co., and having been a reader of your articles in *The Circular*.

I am pleased to note that the patient has a growing sense of vision in the bad eye, and think I can fit him with two pairs of glasses which will bring the visual acuteness in that eye up to a practical working point. He objects to a continual use of glasses, which I advise. N. T. W.

Answer 3.—Question I. This can only be answered by direct experiment on the patient. What is agreeable to one person under these conditions is very disagreeable to another. The majority of persons having one perfect eye cannot be induced to wear such a correction before the defective eye; exceptional cases experience comfort from a correction of the defective eye.

Question II. Such persons having binocular vision seldom, if ever, experience any progressive reduction in the acuteness of vision, because of the bad vision occasioned by the error of refraction.

Question III. It is reasonable to suppose that the right eye will will always do the work for both eyes, although presbyopia becomes well advanced. These patients usually object to the constant use of glasses, because they see comfortably without them.

The patient above described has always done his work with one eye, and I doubt, notwithstanding it would theoretically be better for him to use both eyes, whether he can ever be induced to use them.

In his continued series on the above-named subject, Dr. Bucklin treats of myopia; he says:—In our last number we illustrated in a practical way how the soft condition of the globe which leads to the development of myopia is transmitted from generation to generation. The fact that a person not myopic, but born of myopic parents, may marry an individual who is not myopic, and the greater number of the children resulting may be myopic, has its counterpart illustrating hereditary tendencies in the marriages which have taken place between those who are white and those who are one-eighth African. Under these circumstances one child of a large family of children may show decidedly that he is a descendant from African parents, while in no other member of the family is there the slightest trace.

The eye being soft the power which causes it to stretch consists chiefly in the pressure produced by convergence. Persons having soft eye-balls who use *both* eyes at the working distance continuously develop myopia without exception. Persons who from childhood use one eye continuously at very near and very fine work do not show the same tendency to become myopic. Thus the Swiss watchmaker who follows his trade from childhood does not show the same tendency to become myopic that the student does who enters the university. Where convergence is used in persons having soft eye-balls, the eyes stretch in proportion to the softness of the eye-balls, consequently the stretching process is greater the earlier in life the tasks are commenced, because the younger the person the softer the eye.

The eyes will also stretch in proportion to the nearness and fineness of the work. Again, they will stretch in proportion to the imperfection of the illumination in which the work is done.

It must also be acknowledged that some individuals are born myopic, while others have such soft eye-balls that they develop high degrees of myopia early in life as the result of such use of the eyes as persons require who never obtain an education or never follow an occupation which in any way tasks the eye.

The statistics existing regarding the refraction of newly-born children are as follows: Jaeger found in 100 children 9 to 16 days old, 78 myopic, 17 hyperopic and 5 emmetropic; Ely found in the eyes of 100 newly-born children, 9 cases of myopia; Koenigstein only found 11 cases of myopia in 600 newly-born children. It is evident that, as a rule, where myopia exists during the first 16 days, it is due to a swollen condition of the lens, which condition disappears in early youth, leaving the individual emmetropic or hyperopic. As a result of Cohn's investigations, who found that among village school children only 1·4 per cent. of myopia existed. It appears that, as a rule, children are not born with myopic eyes, and would not become myopic at a later period of life provided there was no necessity to strain the eyes with near work. Among an uncivilised population myopia is quite as rare as it is among newly-born children.

The best idea we can gain of the influence of occupation upon the development of myopia may be gained from the work of Seggle, who examined large numbers of persons without reference to their position in life as they came up for military examination. Seggle examined 1,600 soldiers; he divided them into four classes in reference to the amount of "near work" their special occupations demanded of them. The first class contained the peasants; the second class, labourers, etc., from the city; the third class, artisans; the fourth class contained merchants, clerks and typesetters, etc.; the fifth class contained one-year soldiers who are only obliged upon passing a certain examination to render military service for one year. The myopia is in these classes, from the first to the last, found in increasing degrees; 1st class, 2 per cent.; 2nd class, 4 per cent.; 3rd class, 7 per cent.; 4th class, 44 per cent.; 5th class, 58 per cent. These figures go to show that the chief cause of the development of the myopia is the occupation of the individual, and the youth of the individual at the time the near work is commenced.

The above figures are rather discouraging for those ambitious parents who wish to push with all force their children into literary work at an unreasonably early period of life, and particularly so to those parents who are myopic or who have come from myopic parents.

Myopia in the Schools.

The great work of Cohn is best illustrated by a table showing the results obtained by the examination of 10,060 school children.

Table of Cohn, showing percentage of myopia at different school periods, and the degree of myopia at the corresponding time:—

	Percentage of myopia.		Average degree of myopia.
Village schools	1·4	per cent.	$\frac{1}{24}$·4
Elementary schools	6·7	,,	$\frac{1}{22}$·7
Grammar schools	10·3	,,	$\frac{1}{21}$·9
High school	19·7	,,	$\frac{1}{19}$·6
College	26·2	,,	$\frac{1}{18}$·7
University	59	,,	$\frac{1}{12}$·

The picture of the progressive nature of myopia which the above figures present us with is sad, and should be a lesson to thoughtful parents, guardians and teachers who wish to develop intellectual prodigies too early in life.

Having seen the statistics which demonstrate the evil influences of over-education at too early a period of life, how shall we avoid their consequences? Shall we relapse into a state of semi-barbarism for the purpose of avoiding the evil consequences of myopia? I think not. Civilisation is advancing in the world, and those who do not keep pace with it are certainly lost. It is the place of the public to recognise science, to give the scientific man a chance to do as much good as is possible, and not ignore the present and future welfare of our race in the wild scamper for wealth. Some time could be spent to advantage by every intelligent individual in reading how his five senses are retained and how they are lost. The scholar of to-day who investigates the darkest fields of research without ever stopping to inform himself, even in a popular way regarding the very faculties which make him a successful scholar, certainly cannot be considered broad in his views. We should at least attempt in this age of general educational attainment to render the damage done the eyes in obtaining an education as small as possible.

General Rules regarding the Light in our Schools.

The researches of Cohn in the year 1865 bring out the following astounding facts: in twenty elementary schools examined by him where the ages of the scholars and the nature of the instruction were practically the same, the nature of the light differed widely. The average degree of the myopia differed from 1·8 per cent. to 15 per cent. in direct proportion to the perfect or imperfect illumination of the school-houses. The new schools in broad streets had from 1·8 per cent. to 6·6 per cent. of myopic children, while the schools in the narrow streets of older portions of the city had from 7·7 per cent. to 15·1 per cent of myopic children.

Florschütz found in 1887, 21 per cent. of the children in the *Coburg* schools myopic. After the building of new school-houses he found the percentage of myopia in children of the same age reduced 15 per cent.

From the above fact it is clearly seen that attention to the construction of our school-houses is very important. The length of the school-room should run *north, north-east or north-west*, the teacher's desk being at the southern extremity of the building. Probably the best position for the windows would be south-east and north-east. Direct north and south light is to be avoided, if possible, in the average temperate climate. The climate of certain places may make it desirable to give the school-house a different position.

In foggy countries, direct north and south light may be desirable, while in places near large mountain ranges the position of of the school-house may be best situated to meet local conditions. The position of neighbouring buildings must be considered unless the light is taken through the roof. There should be no seat in the school-room from which the sky cannot be seen. Great care must be taken to regulate the light when it enters from two sides of a building; otherwise the pen and pencil cast a shadow on the work being done, in one-half of the room. After extensive discussion it has been decided that there should be at least one square foot of window surface for every five square feet of floor surface.

The fact that we can reduce the myopia 15 per cent. by the construction of properly-lighted school-houses, leaves us to conclude that there are many other means at our disposal, which, if intelligently understood and made use of in the proper way, at the proper period of life, would do much to check this onward march of myopia, which has followed the attempts made to raise the general standard of education of the race.

Without facts or statistics before us, let us picture by what additional means we may check the increase of myopia:—

1. The eye stretches in proportion as it is soft and this softness is certainly controlled by hereditary influences. This could be in some degree avoided by myopic parents discouraging early in life the marriage of their children into other families known to be myopic.

2. The eye is softer the younger the child. Myopic parents should delay all unnecessary study to as late a date as possible.

3. The eyes stretch in proportion to the nearness and fineness of the work. The playthings used in infancy should be large. The first letters used should be large, and all print for the books of very young children should be as large as possible. German text is bad, much worse than Latin text. [Germans dispute this.]

4. In early school life a working distance of fourteen inches should be insisted on by a mechanical device, if necessary, as a head holder.

If the myopia prevents distinct vision at this distance—lenses should be given which will enable them to maintain a working distance of fourteen inches. It is probably best in children to correct the myopia completely when it is not greater than $\frac{1}{10}$ and in many cases even higher, the child under these circumstances not only gains a good working distance, but with time develops a normal range of accommodations which is usually wanting in myopic persons who have not worn glasses during their youth.

The effect that bad illumination has on myopic eyes has already been considered, and estimated at 15 per cent. It is more than probable that by intelligently-directed attention to the other features causing the development of myopia, it would be reduced at least 60 per cent. from its present state of prevalence. The following table also speaks plainly regarding the prevalence of myopia in Germany.

The study hours between the ages of 10 and 19 are in England, France and Germany as follows :

Study hours in England, 16,500	Exercise hours, 4,500
,, ,, France, 19,000	,, ,, 1,300
,, ,, Germany, 20,000	,, ,, 650

It is thought by the Germans that it is the excess of work done by their children which alone accounts for the prevalence of myopia. They do not believe that their peculiar text is in any way to blame. It is evident that the excessive work is the most prominent factor, but it does seem that the task performed with Latin text is not so trying as it is with German text.

Another bad fault found in the examination of school children, is the faulty glasses they wear when selected without the advice of a specialist. Cohn found of all children wearing glasses 37 per cent. were wearing glasses which were too strong. In such cases any co-existing astigmatism will be found to have been entirely neglected.

Most of the European nations have now a systematic school inspection, under the charge of a thorough specialist, the object of which is in the main to reduce the damage done by progressive myopia. Having considered the nature and etiology of myopia somewhat at length, we will take up its classical consideration in our next.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham ; 6, Lord Street, Liverpool ; and 6, Bank Street, Manchester.

4,114. E. E. Tanner, Birmingham, for "An improved mount for coins, medals, and the like." Dated March 17, 1890.

4,253. G. C. Downing, London (a communication from S. Tonnaire) for "Improvements in solitaires for cuffs and like articles." Dated March 18, 1890.

4,280. J. J. Wood, Liverpool, for "Improvements in or connected with pince-nez, double eye glasses, and other spectacles." Dated March 19, 1890.

4,313. T. G. Hull, London, for "Improvements in watch bracelets." Dated March 19, 1890.

4,444. L. G. Morrell and A. Ritchie, London, for "A seal attachment for sealing wax." Dated March 21, 1890.

4,510. H. D. Wilkinson, Westminster, for "An improved watch-holder." Dated March 22, 1890.

4,530. R. Purdom, London, for "Improvements in the frames of spectacles." Dated March 22, 1890.

4,590. W. Baker, London, for "Improvements in or applicable to clocks." Dated March 24, 1890.

4,591. J. T. Gent, A. W. Staveley, and J. H. Parsons, London, for "Improvements in watchmen's or tell-tale clocks." Dated March 24, 1890.

4,599. L. Donne and M. Donne, London, for "Improvements in watches and clocks." Dated March 25, 1890.

4,609. G. J. Lysaght, London, for "Improvements in watches, etc." Dated March 25, 1890.

4,633. R. Wright, Chesterfield, for "A tapered pipe key, for winding up watches, clocks, musical boxes, roast jacks etc., the pipe running through." Dated March 25, 1890.

4,687. J. A. Heuston, London, for "Improvements relating to watch case bows or attachments and alarms in connection therewith." Dated March 25, 1890.

4,752. W. Williams, London, for "Improvements in stop watches." Dated March 26, 1890.

4,880. T. Beal, Eastbourne, for "Improvements in fastenings and pins for all kinds of brooches." Dated March 28, 1890.

5,240. T. Griffiths, Glasgow, for "An improved watch key." Dated April 5, 1890.

5,245. J. Davidson, Birmingham, for "An improved case or pocket for the protection of watches, coins or other articles." Dated April 5, 1890.

5,257. E. Edwards, a communication from T. Haagensen, Denmark, for "Improvements in apparatus for recording time." Dated April 5, 1890.

5,266. G. Bishop, London, for "An improved combined pencil case and key." Dated April 5, 1890.

5,428. A. Donaghy, Dublin, for "Improvements in clocks and watches." Dated April 10, 1890.

5,465. J. C. Montgomerie, London, for "Improvements in keys." Dated April 11, 1890.

5,549. L. Drews and R. Senner, London, for "Improvement in metallic articles of ornament for personal wear." Dated April 12, 1890.

5,576. W. R. Moore, London, "Improvements in and connected with striking clocks." Dated April 12, 1890.

5,718. J. C. Fell, a communication from E. Leach and S. D. Morris, United States, for "Improvements in the method of and machinery for decorating watch-case backs, caps and censers." Dated April 15, 1890.

5,759. F. W. T. Turton, Birmingham, for "Improvements in or additions to the bars of watch and dress chains." Dated April 16, 1890.

5.760. F. W. T. Turton, Birmingham, for "Improvements in coin and ornament mounts." Dated April 16, 1890.

5,909. W. J. Nilhus and E. C. Nilhus, London, for "Improvements in fastenings for brooches, medals or the like." (Complete specification). Dated April 18, 1890.

Recent American Patents.

Medicine Spoon. M. Young	423,018
Clock. A. M. Lane	423,058
Dial Painting Machine. C. B. Nichols	423,077
Electro-plating Non-Metallic Articles. W. H. Winslow ...	423,101
Watch-case Spring. P. Muhr	423,174
Bracelet, Method of Making same. F. Hartje	423,246
Slide Callipers. M. F. Smith	423,284
Calendar Attachment for Pencils, etc. J. A. Faust	423,233
" " " "	423,234
Fountain Pen Holder. H. Pearse	423,339
Clock Levelling Device. J. R. Broadstreet	423,411
Bracelet. J. C. Harrington	423,605
Catch for Chatelaines, etc. L. B. Prahar	423,630
Cap for Cruets or other Vessels. S. B. Simon	423,639
Collar or Cuff Button. B. Visanska	423,841
Apparatus for the Manufacture of Beads of Enamel. D. Swarovski	423,579
Fountain Pen. F. S. Heath	423,684
,, ,, G. S. Parker	423,804
,, ,, L. A. Shattuck	423,822
Watch Case. F. Mink	423,939
Watch Cases, Manufacture of. S. T. J. Byam	424,048
Ring. W. M. Kaas and P. Jeanne	424,211
Button or Stud. A. Whitney	424,153
Pendant Set Watch. F. G. Faxon	424,189
Watch Case Pendant. E. C. Fitch	424,191
Eye Glasses. H. D. Martin	424,217
Applying Designs to Watch Dials. F. Schmulz	424,228
Watch Guard. J. Siff	424,362
Focusing Mechanism for Optical Instruments. E. T. de Wogan	424,399
Clock-winding Mechanism. A. Hitt	424,418
Machine for Spinning Metal into irregular Shapes. J. Browning	423,904
Blowpipe. W. R. and J. R. Rawlings	424,024
Watch-winding Mechanism. S. Donne and M. Donne (London)	424,185
Spring Motor. J. G. E. Reichard	424,220
Electro-Magnetic Watch Clock. R. B. Carr	424,268
Electric Time Dial. C. A. Colby	424,273
Watch Case. F. Mink	424,491
Making Spoons and Forks. William Rogers	424,503
Hinge Joint for Jewellery. D. F. Adams	424,529
Clock Key. R. Ueltzen	424,563
Opera Glass Holder. L. W. Levy	424,611
Jewellery. F. X. Zirnkilton	424,749
Clock-striking Mechanism. A. M. Lane	424,796
Alarm Clock. A. M. Lane	424,797
Magazine Pencil Case. M. Schreiber	424,621
Ticket Holder. F. F. Chase	424,642
Hairpin. M. Caskin	424,670
Belt Buckle. C. Deitsch	424,765
Double-faced Electric Clock. E. W. Lindenau	424,929
Finger Ring. R. Fouchs	425,096
Stem Winding Watch. A. H. Potter (Geneva)	425,342
Watch Bow Fastener. C. M. Fogg	425,375
Picture-Holding Attachment for Badges, etc. O. W. Bennett...	425,201
Watch Bow Fastener. F. Mink	425,382
Watch Case. F. Mink	425,383
Electric Alarm for Clocks. R. Schmitz	425,004
Bouquet Holder. F. A. Moore and F. Schreyer	425,082

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

BERKS.

Benson, F. (Sarah Zucker, wife of Moss Zucker, trading as), 35a, King's Road, Reading, jeweller. Unsecured Liabilities, £244. Estimated Net Assets, £200. Composition of 19s. 11d. in the £, payable by 24 equal monthly instalments, commencing April 24, 1890; the first twelve payments secured by a guarantor. Deed of Composition dated March 24, 1890; filed March 31, 1890.

Creditors.		£	s.	d.
Freeman, H. C.	London	12	4	0
Bromet, A., and Co.	"	14	0	0
Hirsch, Pritchard, and Co.	"	19	3	6
Colls, G.	"	17	0	0
White and Ridsdale (Mr. Zucker's debt, but secured by Mrs. Zucker, to pay 2s. 6d. weekly for first six months, after that time 5s. weekly.)	"	22	0	0
Shuker, A.	Birmingham	10	10	1
Greenberg, T. S., and Co.	"	47	17	10
Satchwell and Co.	"	14	0	0
Bottrill, G., and Son	Reading	25	15	1

LANCASTER.

Murray, William, 23, Brackley Street, Farnworth, watchmaker and jeweller. Trustee, J. C. Forrester, Acresfield, Bolton, C.A. Unsecured Liabilities, £168 7s. 2d. Estimated Net Assets, £70. Deed of Composition dated March 21, 1890; filed March 28, 1890.

Creditors.		£	s.	d.
Murray, Jane	near Bolton	63	0	0
Simpson, J. C.	Manchester	10	15	0
Shoeps Bros.	"	51	8	3

NORFOLK.

Burrow, Henry, Bridge Street, Saint George's. Norwich, watchmaker. Trustee, Ralph L. Bliss, Redwell Street, Norwich, accountant. Unsecured Liabilities, £63 1s. 5d. Estimated Net Assets, £24. No Creditors over £10. Deed of Composition dated April 2, 1890; filed April 9, 1890.

Duncan, Walter, artist, 14, Green Street, Grosvenor Square, late 86, South Hill Park, Hampstead, and 6, Park Road Studios, Haverstock Hill, all London.

Creditors.		£	s.	d.
Franks, Miss	London	12	0	0
Fox, H.	"	10	0	0
Grautham, —	"	41	0	0
Green and Edwards	"	25	4	6
Gervis, J.	"	10	0	0
Newman and Co.	"	28	1	1
Pinxton Coal Co.	"	14	12	0
Rogers, J. J.	"	37	11	0
Richards, J.	"	15	8	5
Wallan, R.	"	15	0	0
Franey, Mrs.	Brighton	13	7	2

Total Estimated Debts—£297 15s. 6d.

Lowe, Joseph, importer of marble, wood, and gilt clocks, 35, Myddleton Street, Clerkenwell, London.

Creditors.		£	s.	d.
Central Bank of London, Limited	London	19	10	0
Dayton, K. P.	"	10	0	0
Gydes, T.	"	60	0	0
Merzbach and Co.	"	40	0	0

Total Estimated Amount—£144 17s. 4d.

Preferential Creditors.

New River Co. ... 35 5 0

Total Estimated Amount—£43 10s. 8d.

Myers, Joseph, dealer in clocks and fancy goods, 5, Duke Street, Aldgate, London. The following circular has been issued herein :—"46, Finsbury Circus, London, E.C., 9th April, 1890. Gentlemen,—Be good enough to attend a meeting of the creditors of Mr. J. Myers, of 5, Duke Street, Aldgate, dealer in clocks and fancy goods, to be held at the Guildhall Tavern, Gresham Street, London, E.C., on Tuesday, the 15th day of April, 1890, at 2.30 o'clock in the afternoon, when a statement of his affairs will be submitted.—Yours obediently, W. H. WALE."

Creditors.		£	s.	d.
Ansonia Clock Co.	London	66	7	10
American Trading Co.	"	61	12	7
Baden Clock Co.	"	267	18	5
British United Clock Co.	"	102	3	1
Judda, F.	"	88	1	6
Nathan, W., and Bros.	"	41	10	0
Rasmussen, Webb, and Co.	"	48	18	0
Simmons, J.	"	497	3	7
Merzbach, Lang, and Fellheimer	"	277	11	1
Brandon Bros.	Birmingham	35	17	0
Baker, C., and Son	"	19	12	6
Cox Bros.	"	70	10	0
Levetus Bros.	"	29	6	4
Lotheim, M. and S.	"	68	5	6
Male and Jones	"	41	10	11
Nathan Bros.	"	85	12	6
Payton, F. W.	"	99	10	6
Pearce and Thompson	"	134	11	11
Rooker, J.	"	81	8	4
Reynolds and Westwood	"	46	9	2
Smith Bros.	"	65	7	2
Webb, F.	Birmingham	65	4	11
Walton, G. E., and Co.	"	98	12	8
Jahresuhren, Fabrik	Triberg	69	10	0
Laverne, A., and Co.	Paris	26	10	6
Batt, J.	Sheffield	10	9	8
Winter and Adler	Vienna	11	8	0

Total Estimated Amount—£2,548 1s. 3d.

Preferential Claims ... 35 0 0

A meeting was held herein, on the 15th ult., when an offer of 6s. 8d. in the £ was made, but not accepted.

Druiff, Lionel, trading as Henry Laurance, and as the Society of London Opticians, wholesale and manufacturing optician, 44, Hatton Garden, Holborn, and 26, Doughty Street, and Colonial Buildings, 23, Hatton Garden, all London.

Creditors.		£	s.	d.
Beckman Bros.	London	10	16	6
Blaxall and Co.	"	15	10	0
Baron and Bion	"	10	0	0
Connitti and Son	"	23	19	0
Citron, C.	"	15	0	3
Coulson, J.	"	80	0	0
Druiff, A.	"	21	2	9
Fish, H.	"	80	0	6
Hyams, J.	"	39	7	0
Harrison Bros. and Howson	"	22	1	0
Judda, F.	"	60	8	6
Jacobs, —	"	10	0	0
Lawrence, E.	"	10	0	0
Le Voi, E.	"	20	0	0
Levy, Lewis	"	110	0	0
Marcaso, E. M.	"	76	13	6
Moore, H.	"	81	12	9
McCorquodale and Co., Limited	"	77	11	0
Martin, R., and Son	"	23	2	4
Moses, A.	"	16	10	8
Phillips, F. A.	"	592	3	0
Rolez and Co.	"	61	5	0
Renshaw, R.	"	11	17	1
Straker, C., and Son	"	35	17	5
Shepherd, Dr.	"	48	7	6
Société des Lunetiers	"	27	2	1
Smith, W. H., and Son	"	13	7	9
Wilkie, E.	"	168	0	0
Shorter, F.	"	114	1	11
Samuels, P.	"	16	10	0
Newbold, A. E.	"	96	19	1
Druiff and Druiff	Ashford	42	19	1
Druiff, Mrs.	"	170	0	0
Davis, O.	Birmingham	49	0	0
Redfern, J.	"	250	17	2
Wheway, E.	"	131	9	0
Perrad, E.	Jura	309	17	0
Colin, Henri	Morez die Jura	10	0	0
Jauvier, E.	"	33	12	5
Lamy, D., and Co.	"	203	0	0
Gray, F., and Co.	Newcastle-upon-Tyne	17	12	6
Jacquemin, J.	Paris	57	17	3
"Scarborough Gazette"	Scarborough	10	0	0
Moss, Mrs.	South Hampstead	549	6	0
Walters, Thomas	Wolverhampton	94	0	0

Total Estimated Amount—£4,444 14s.

Partly-Secured Creditors.

		£	s.	d.
Druiff Bros. (Estimated value of security, £20.)	London	34	3	0
Elias, Miss (Estimated value of security, £56 19s. 8d.)	"	244	3	0
Lacy, Hartland, Woodbridge, and Co. (Estimated value of security, £868 9s. 8d.)	London	1,056	11	1

Total Estimated Amount—£1,334 17s. 1d.

Liabilities on Sheet "D" ... 1,872 7 7

(Expected to rank.)

Liabilities on Sheet "F" ... 836 11 1

(Not expected to rank.)

Preferential Creditors.

Rates and Wages ... 39 8 9

Wilson, Eleazer, pawnbroker, etc., 15, Bolton Street, and 221, Water Street Chorley ; and formerly 73, Parkinson Street, Mill Hill, Blackburn.

Creditors.		£	s.	d.
Hyam and Co.	London	15	6	7
Grundy, James	Chorley	299	6	0
Tottersall, Mary	"	38	6	8
Horsfall, J.	Hebden Bridge	16	8	2
Lomas and Co.	Leeds	21	11	3
Downing and Co.	Leicester	28	18	6
Chorlton Bros.	Manchester	54	7	5
Cooper and Co.	"	10	3	0
Crook and Son	"	12	4	0
Smith, Ellis, and Co.	"	14	1	4
Squirrel, S. A.	"	31	9	6
Woods, S. J., and Co.	"	101	15	0
Astin, John	Sowerby Bridge	11	1	2
Manchester and Salford Bank		43	0	0

Total Estimated Debts—£810 4s. 8d.

McShane, Charles V., jeweller, Victis House, Chelverton Road, Putney, London.

Creditors.		£	s.	d.
Burgess and Savage	London	35	11	6
Darling, A. J.	"	371	7	6
Evans, T.	"	48	0	0

		£	s.	d.
Foster, G.	London	14	16	0
Hawkins, C.	„	500	0	0
Hahn and Co.	„	141	10	0
Harrison, —	„	31	0	0
Imperiali, W.	„	158	10	0
Jones and Son	„	100	0	0
Jones, J. M.	„	30	12	6
Mege, A.	„	100	0	0
McShane, S.	„	380	0	0
McShane, J.	„	35	0	0
Martin and Co.	„	90	0	0
O'Hara, —	„	64	15	0
Phillips, J.	„	115	0	0
Phillips, S. J.	„	31	4	0
Pile and Co.	„	15	0	0
Picard, —	„	11	0	0
Ridgeley, T.	„	162	5	0
Roper, W.	„	11	16	2
Spink and Son	„	75	0	0
Schlesinger, —	„	25	0	0
Tompson Bros.	„	10	0	0
Van Praag, —	„	25	0	0
Whitehorne, E.	„	1,155	3	0
Weiss, —	„	88	14	0
Weiss, S.	„	70	11	0
Whiskard, E.	„	18	0	0
Rolt, H.	Brighton	500	0	0
Houghton, —	Coventry	58	12	2
Lawrence, A.	Paris	45	10	0

Total Estimated Amount—£4,683 19s. 1d.

Fully-Secured Creditors.

		£	s.	d.
Attenborough, —	London	10	0	0
Barnett, B.	„	2,133	11	0
Jones, J. M.	„	22	0	0
Harrison, —	„	285	0	0
Temperance Building Society	„	790	10	11

Total Estimated Amount—£3.241 1s. 11d.

Partly-Secured Creditors.

		£	s.	d.
Brann, J.	London	1,405	0	0
Last and Son	„	1,275	19	2

Total Estimated Amount—£2,680 19s. 2d.

Preferential Creditors.

		£	s.	d.
Alliance Investment Co.	London	27	10	0

Adams, Edward James, optician, jeweller, and silversmith, 82, Bull Street, 34, St. Paul's Square, and 23, Great Western Arcade, Birmingham.

Creditors.

		£	s.	d.
Jupilmein Bros.	London	26	4	0
Michel and Co.	„	29	0	0
Davenport, G.	Birmingham	25	0	0
Mason, J.	„	10	8	0
Phillips, H.	„	10	1	0
Swann and Co.	„	10	0	0
National Provincial Bank	„	60	0	0
Loan and Discount Co.	„	10	0	0

Total Estimated Debts—£230.

Galloway, James, jeweller and watchmaker, late Wellington (Salop); now 130, Briggate, Leeds.

Creditors.

		£	s.	d.
Jones, R. H.	London	15	12	2
Little, James, and Co.	„	16	14	6
Schaeffer and Co.	„	12	2	0
Constantine and Floyd	Birmingham	31	9	9
Ginder, W. J.	„	45	6	2
Griffith, William	„	20	17	5
Gyde, E. L.	„	20	5	9
Johnson, G. H., and Co.	„	21	11	0
Platnauer Bros.	„	10	9	6
Silverston, J., and Co.	„	72	4	4
Willis and Co.	„	59	2	0
Baker, Mrs.	Harrowgate	200	0	0
Morris, Ephraim	Leeds	12	0	0
Quilliam, S., and Sons	Liverpool	10	19	6
Otley, Thomas, and Sons	Sheffield	14	12	3
Walker and Hall	„	32	13	0
Fryer, Miss	Starbeck	150	0	0
Creditors under £10		63	6	0

Total Estimated Amount—£809 5s. 4d.

Fully-Secured Creditors.

		£	s.	d.
Smith, Dr.	Leeds	675	0	0
Davies, A.	„	25	0	0
Preferential Creditors		11	4	7

Hoddell, James, and Co. (Cope Hoddell), watch manufacturer, Chapel Fields, Coventry.

Creditors.

		£	s.	d.
Ayres, T. R.	London	52	3	0
Oliver, James	„	31	7	0
Webb, F. and W. G.	„	206	0	0
Davis, Michael	Birmingham	235	0	0
Iliffe, Dr.	Coventry	20	0	0
Lloyd's Banking Co.	„	3.995	15	0
Peirson, E. P., and Son	„	15	15	0
Southam, J.	„	10	0	0
Union Banking Co.	„	150	0	0
Jephson and Birt	Leamington	15	0	0
Samuel and Rogers	Liverpool	165	5	0

Total Estimated Amount—£4,937 1s. 6d.

Partly-Secured Creditors.

		£	s.	d.
Woodman, P., and Son	London	122	14	0
(Estimated value of security, £64.)				

Preferential Creditors.

		£	s.	d.
Comley, J. B.	Coventry	12	0	5
Hoddell, James (Exors. of)	„	40	0	0
Rates, etc.	„	18	1	4

Total Estimated Amount—£70 1s. 4d.

BANKRUPTCY PROCEEDINGS.

Hoddell, Cope, trading as James Hoddell and Co., Chapel Fields, Coventry, and 4, Oxford Terrace, St. Mary Church, Torquay, watch manufacturer. Adjudication: March 26.

Lowe, Joseph, 35, Myddelton Street, Clerkenwell, importer of marble, wood, and gilt clocks. First meeting: 33, Carey Street, W.C., April 16 at 11. Examination: 34, Lincoln's Inn Fields, April 28 at 12½.

Galloway, James, late 130, Briggate, Leeds, now Wellington, of no business, late watchmaker and jeweller. First meeting: Official Receiver's, Leeds, March 28 at 12. Examination: C.C., Leeds, April 15 at 11.

Wilson, Eleazer, 15, Bolton Street, and 221, Water Street, Chorley, formerly 73, Parkinson Street, Mill Hill, Blackburn, pawnbroker and draper. Receiving Order: March 18. First meeting: 16, Wood Street, Bolton, March 31 at 3. Examination: C.C., Bolton, April 14 at 11½. Adjudication: March 21.

McShane, Charles V., Victis House, Chelverton Road, Putney, jeweller. First meeting: 119, Victoria Street, S.W., April 10 at 3. Examination: Court House, Wandsworth, April 24 at 12.

Sanders, Thomas, 24, Great Sutton Street, Clerkenwell, and Clematis Villa, 45, Granville Road, Walthamstow, watch and clock material dealer. Receiving Order and Adjudication, April 3.

Reyner, Fred., 24, High Street, Redcar, watchmaker and jeweller, late commercial traveller. Receiving Order and Adjudication: April 1.

Reyner, Fred., 24, High Street, Redcar, watchmaker and jeweller, late commercial traveller. First meeting: Official Receiver's, Middlesbrough, April 24 at 11. Examination: Court House, Stockton-on-Tees, April 23 at 10½.

Long, Joseph Edward, Bishop's Stortford, pawnbroker and clothier. Receiving Order: April 3.

Mudon, E. Sybella, 46, Kirkdale, Sydenham, jeweller. Receiving Order: April 11.

McShane, Charles V., Victis House, Chelverton Road, Putney, jeweller. Adjudication: April 14.

Long, Joseph Edward, Bishop's Stortford, pawnbroker and clothier. Adjudication: April 14.

Myers, Joseph, 14 (formerly known as 5) Duke Street, Aldgate, and 13, Salisbury Road, Dalston, wholesale optician and jeweller. Receiving Order: April 18.

Druiff, Lionel, trading as Henry Laurance, and as the Society of London Opticians, 44, Hatton Garden, Holborn, 26, Doughty Street, and Colonial Buildings, 23, Hatton Garden, wholesale and manufacturing optician. Adjudication: April 14.

Hancock, Matthew James, 44, Market Place, Burslem, jeweller. Receiving Order and Adjudication: April 14. First meeting: Official Receiver's, Newcastle-under-Lyme, April 25 at 11. Examination: Town Hall, Hanley, April 30 at 11.

ADMINISTRATION ORDERS.

Cooper, Thomas, 80, Cobden Street, Darlington, sawyer. £30 6s. 5d. Twenty-seven creditors. March 19. No. 34.

Watson, Leonard, 33, Cramer Street, Gateshead, watchmaker. £39 11s. 3d. Twelve creditors. March 14. No. 5.

MEETINGS OF CREDITORS.

Re J. A. VASSALI, JEWELLER, NICHOLAS STREET, SCARBORO'.—In pursuance of a circular issued by Mr. Tasker Hart, solicitor, Scarboro', a meeting of the creditors of the above was held at the "Inns of Court," London, on the 9th ult., when the statement of affairs submitted showed liabilities £2,437 8s. 11d., and the nett assets devisable amongst the unsecured creditors £626 14s. 2d. It appears that in 1888 an arrangement had been made, whereby the then creditors received 10s. in the pound, and since that time the debtor appears to have been more or less unsuccessful, and, in consequence of the holder of a bill of sale which had been given to provide the funds for the payment of the dividend under his former failure having taken possession, it was deemed necessary to convene a meeting in order that some arrangement might be made with the trade creditors. No offer of composition was, however, made to the meeting, but it was ultimately decided that the meeting should be adjourned for ten days in order to give the debtor an opportunity to make an offer of composition, and with this object Mr. G. G. Poppleton, C.A., general manager of the Wholesale Traders' Association, along with Mr. Tasker Hart, solicitor, Scarborough, were appointed to endeavour to effect some arrangement whereby the trade creditors might receive a cash composition, and to report at the adjourned meeting.

Re JOHN PYPER, HIGH STREET, BELFAST, JEWELLER.—A meeting of the creditors of the above was held at the offices of the Wholesale Traders' Association of the Jewellery and Hardware Trades, Temple Row, Birmingham, on the 27th March last, when a statement of affairs showing liabilities £2,088 9s. 7d. and assets £886 13s. 11d., as prepared by Messrs. Poppleton and Appleby, chartered accountants, was duly submitted to the meeting. The meeting was largely attended and after some discussion it was resolved to accept a composition of 6s. 8d. in the pound, payable at four, eight and twelve months from the 1st day of April, the two last instalments secured to the satisfaction of Mr. G. G. Poppleton, general manager of the Wholesale Traders' Association, and Mr. William Griffiths, of Birmingham, jeweller. It was also decided as a further security that the debtor should execute a deed of assignment to Mr. Poppleton and Mr. Griffiths in trust for the creditors, pending the carrying out of the arrangement.

The Watchmaker, Jeweller & Silversmith

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The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

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409, George Street, Sydney.

EDITORIAL

WHAT has been termed the transition state of the English watch trade has lately been as much in evidence as ever. That the "new" system has neither completely come in nor the "old" system (or absence of system) of manufacture completely gone out—that is to say, in regard to the exclusion of the one or the other—is abundantly evident. That there should be any reason why any one particular system of manufacture should completely exclude every other system, we have always failed to see, and it is on record, both in these columns and elsewhere, that we have pointed out that various systems, or at all events selections of the best of various systems, could very well run side by side without interfering with one another, even if they could not be worked together. We shall shortly be afforded an opportunity of judging of the possibilities of nearly every individual system, as we shall have no fewer than seven principal manufactories working on as many different, and more or less modern, lines, to say nothing of those who still adhere to the old handwork methods. The factories we refer to will be representative, of London, Coventry, Birmingham, and Prescot; and the systems will range from the completely equipped automatic watch company—producing the entire watch, from the case downwards, and which is represented in three at least of the above-named places—down to the most recently-formed watch-movement and watch-case companies (which may either combine with one another or may not) that will allow of the trade buying their productions separately or together, and with much or little finish to them. We don't think the "old" system, or a judicious combination of it with more modern methods, is quite dead yet, and should be very sorry to think so. There are enough automata in the country already, without manufacturing more than we can help, and to altogether turn skilled workpeople into machine minders (although, even in that capacity they would prove more satisfactory than their unskilled competitors) is a waste of material which can be ill afforded. However, the foregoing are merely our lucubrations at the end of a dull month, and may be of little value as an opinion. Should the purely automatic principle prevail or predominate in the near future, we shall, perhaps, have to trim.

General Notes

A Mandalay despatch reports that a large ruby weighing 304 carats has been found at the mines.

Early Closing.—The watchmakers and jewellers of Plymouth have agreed to close their shops on Wednesdays at 4 p.m., and other days (except Saturdays) at 8 p.m., until the end of September.

Wanted.—A reward of £200 has been offered for the apprehension of Frederick Harrison, a jewellers' porter at Messrs. Halton and Slocombe's, jewellers, of Moorgate Street, who on April 16 decamped with over £2,000 worth of jewellery.

According to the *Jewelers' Journal*, which is published in that city, there are no fewer than 25,000 persons in Chicago who are entirely dependent on the jewellery trade for a livelihood, a large proportion of whom are among the better class of the working people.

Steel and silver art jewellery, as it is called, is the newest fad in fancy ornamentation. This consists of chatelaine appendages of various unique devices, brooches, bangles, belt buckles, and dog-collars, some of the latter being set with cairngorms or dark-blue faced criplets.

The Duchess of Edinburgh's Jewels Stolen.—The jewels belonging to the Duchess of Edinburgh were stolen in the early part of last month from the Balmoral Hotel, Edinburgh, during the absence of the Duke and Duchess at the opening of the International Exhibition. Various statements are made as to the value of the jewels, but it is generally believed that they represent a large sum of money.

The Drawback.—In answer to Mr. H. J. Wilson, the Chancellor of the Exchequer said: I intend to introduce a clause in Committee of the Budget and Inland Revenue Bill, providing for interim sales of silver-plate, which I understand the hon. member wishes to facilitate. The clause shall be put upon the paper immediately after the second reading in order to give publicity to the arrangements.

Old Plate.—Horace Walpole's silver salver, which was engraved upon by Hogarth, came once more into Christie's last month; it bears the hall-mark 1723, and weighs 12 oz. 14 dwt. It was made by Paul Lamerie. Another piece of the same silversmith's handiwork is a very elegant oval bread-basket, 72 oz. 12 dwt. in weight, the property of Lady Sybil Tollemache, which was put up at the same time, with an Elizabethan tankard (1576), a rosewater dish (1699), and other items.

It is estimated, says the *Watch Dial*, that some of the small sized watches which have been offered to the trade during the past year have cost their manufacturers, in tools, machinery, and advertising, not less than 1,000 dols. for each movement produced. As these movements are unsaleable at any price, no wonder as the owners look at the costly machinery used on this and previous failures, that they yearn for "an English syndicate."

A New Alloy.—A new non-magnetisable alloy is described for use in the place of steel in the manufacture of various parts of watches, such as the balance wheel and hair spring, the composition of which is as follows:—Gold 30 to 40 parts, palladium 30 to 40 parts, rhodium $\frac{1}{10}$ to 5 parts, copper 10 to 20 parts, manganese $\frac{1}{10}$ to 5 parts, silver $\frac{1}{10}$ to 5 parts, and platinum $\frac{1}{10}$ to 5 parts. The copper and manganese are first of all to be melted, and the other metals afterwards added, or the whole of the constituents may be placed in the crucible at once, with the manganese at the bottom.

An Interesting Exhibition.—The exhibition of jewellery which is now being held at the Kunstgewerbe Museum at Berlin is a most interesting show. Prominent among the exhibits are some magnificent sets of ornaments lent by the Empress of Germany, who has received them as presents at various times from the Empress Frederick, the Emperor, and the King of Italy. They are all made at Castellani's famous workshop at Rome. The most admired among them is, perhaps, the necklace presented by the Empress Frederick, which consists of a chain of double chrysanthemum blossoms in gold, the centre of each flower being a very fine small pearl. Fine lotus flowers, with pearls pending from them, connect the larger blossoms, each of which has a pendant of a small gold head of Hero.

The Import of Silver-Plate.—In answer to Mr. King, the Chancellor of the Exchequer said, directly the Board of Customs learnt that certain foreign silver-plate imported in baggage before April 30 had been considered by their officers to be still liable to duty, they issued the following order. "The Board authorise delivery of plate imported prior to the 1st inst. free of duty, provided it be constructively warehoused. Deposit in the baggage warehouse to be considered a constructive warehousing for this order. The usual declaration is to be made if the plate is for private use; in that case the assay will not be required. I may add that the Act requires that such plate should be deposited in a bonded warehouse, and the meaning of the Customs order is that deposit in the baggage warehouse shall count as warehousing for the purposes of the Act.

The Chancellor of the Exchequer, replying to several hon. members in the House of Commons, after we went to press last month, said it was not the duty of the Government as at present advised to make any alteration in any essential particular in the law regulating the Hall-marking of gold and silver plate. Only technical changes were necessary by reason of the abolition of the duty. It was not possible to prolong the period of the present duties, for whilst that might satisfy some grievances it would raise others. Personally, he saw no objection to the marking of British plate of any quality for exportation, but a great majority of the trade was in favour of maintaining compulsory Hall-marking on its present basis, and he did not see how the two systems could be combined. Now that the plate duties had been abolished, all questions relating to Hall-marking belonged to the Board of Trade and not to the Treasury.

Bonner *v.* Lyon.—In the Queen's Bench Division on the 8th ult. (Thursday), before Justices Grantham and Vaughan Williams, sitting as a Divisional Court, the case of Bonner and Co. v. Lyon and another came on for hearing. The action was brought by the plaintiffs, who are jewellers in Brighton, against the defendants, Mr. and Mrs. Lyon, to recover the price of certain goods sold by them to Mrs. Lyon, and when the case was tried before Mr. Justice Denman and a jury at Lewes, a verdict was given for the plaintiffs against Mrs. Lyon. In the present action the plaintiffs wished to enter judgment in their favour against the separate estate of Mrs. Lyon, and their motion was resisted on the ground that they had not proved she possessed private property at the time the goods were bought. After hearing the arguments, their Lordships ordered judgment to be entered for plaintiffs for £144 and costs.

Plate Licenses.—David Isaac, jeweller, of 2, Woodhouse Lane, was summoned at the Leeds Town Hall last month for having sold a gold chain weighing over three ounces requiring the higher rate of license, whereas he was only licensed at the low rate. Mr. C. C. Trim, supervisor of the Inland Revenue, prosecuted. Defendant pleaded guilty, and urged that as there was no trade for heavy chains he had not got a license out. This was the only chain of its sort he had in the shop. Defendant, it appeared, was cautioned in the year 1883 for a similar offence, and was comprised £2 by the Inland Revenue. Mr. Bruce said the full amount of penalty was £50. That, probably, would be far too much, but still he would have to inflict a substantial penalty, because people must be taught that they must not infringe the law, especially when they had had one warning. He fined him £10. Defendant applied for time to pay the money, but it being stated that he was in a large way of business this was refused.

Three Months' U.S. Patents.—During the three months, July, August and September, 1889, the records of the United States Patent Office show that 109 patents, 21 design patents, and five trade-marks pertaining to the jewellery, watchmaking and kindred trades were granted. The following is a classified statement :—*Patents* : Clocks, 11 ; watches, 30 ; time detectors, etc., 7 ; jewellery, 5 ; optical goods, 16 ; silverware, 6 ; tools, 13 ; machinery and processes, 10 ; metallurgy, 9 ; miscellaneous, 2. *Designs* : Jewellery, 7 ; silverware, 11 ; horology, 3. *Trade-marks* : Jewellery, 2 ; silverware, 1 ; horology, 2. The large number of patents on improvements in watches and optical goods is a remarkable feature of the above. In stem winding and setting watches alone seven patents were granted. Regarding optical goods, perhaps no manufacture in the line of small wares is at the present time commanding more inquiry and experiencing greater improvements. Of the thirteen patents, seven were on eyeglasses, three on spectacles, and two on opera-glass holders.

Watch and Clock Makers' Pension Society.—The half-yearly meeting of the subscribers was held on April 29 at the Horological Institute, Northampton Square, for the appointment of office-bearers and the election of a male annuitant to the benefits of the society. The Chairman (Mr. T. Baxter) expressed his regret that there was not a more liberal subscription list, but this, he said, was partly accounted for by the fact that the trade of Clerkenwell was still, unfortunately, in the depressed condition which had characterized it during recent years. He hoped, however, better days were in store for it. The elections were then proceeded with. Mr. J. Woodman was elected to the trusteeship, vacated by Sir John Bennett, and Mr. T. Baxter was again unanimously re-elected treasurer. The Secretary subsequently announced that the total number of pensioners admitted to the institution was 239, to each of whom had been granted liberal relief, with an addition of 10 per cent. on all subscriptions or donations paid by them.

The Abolition of the Plate Duties.—The following are the resolutions that were put and carried at the meeting of the London Silver Trades Council, which was held after we went to press last month.—(1.) "That this meeting of workmen employed in the silver-plate industry, and the various branches thereof, urges the Chancellor of the Exchequer to give immediate effect to his Budget proposals regarding the duty on silver-plate, as any delay will cause a slackness in the trade and be detrimental to the interests of the workmen." (2.) "That this meeting trusts that the Chancellor of the Exchequer will adhere to his decision to retain the compulsory Hall-mark, as its abolition will encourage the manufacture of silver of an inferior quality, and at the same time take away the safe-guard from the consumer." (3.) "That we as workmen in the silver-plate industry believe that the letter 'F' on our Hall-mark is not a sufficient distinction between English and foreign manufactured silver-plate, and this meeting recommends that every piece of manufactured silver-plate imported shall be distinctly impressed with the name of the country where it was manufactured.

Opening of the Edinburgh Exhibition by the Duke of Edinburgh.—There was a creditable ingenuity about the contrivance referred to by the special correspondent of the *Daily News* at Edinburgh for giving the Duke of "that ilk" a really useful souvenir of his services yesterday in opening the Edinburgh Exhibition. The entrance doors were linked together by a heavy gold chain locking in a richly-carved centre-piece showing the city arms enamelled in colours and in bold relief. When the Duke unlocked it he would be in possession of a chain making a handsome bracelet for the Duchess. The tiny key by which it was unlocked was hinged on, and ingeniously folded into, the shield of a gold finger ring. The face of the shield bore the initial E. under a ducal coronet. These possessions are a manifest improvement on the useless ornaments hitherto accumulated by royalty on ceremonial occasions, and should suggest similar substitutes for the silver trowels, mallets, and spades with which our Princes are burdened at the laying of foundation-stones, cuttings of first sods, and so forth. In this case the conversion of the opening instruments into jewellery was a particularly happy thought, for the Duke had the misfortune to have jewels stolen from him last month, and it was well that he should have received some trifling compensation in advance.

A County Court Point.—At the Hartlepool County Court last month, Nicholas Barrasford, pitman, of Castle Eden Colliery, sued Emmanuel Fryde, jeweller, of Sunderland, to recover £15, money overpaid to the defendant and damages sustained by an excessive levy in two executions. Mr. Wilson appeared for the plaintiff, and Mr. Fryde, jun., for his father. It appeared that in 1883 defendant sold a watch to the plaintiff for £6 10s., to be paid for by instalments, which being irregularly kept up, the defendant sued for the balance in 1884 at the Durham County Court, judgment being given in his favour for 4s. per month. Instead, however, of paying the money into court, the plaintiff paid it to the defendant, and the latter accepted it; but upon the lapse of the payments on the proper dates he issued an execution, but nothing was realised from it, though the costs incurred amounted to £3. A year later a second execution was issued, and £5 realised, leaving, according to Mr. Fryde's version, a balance of £3 or £4 still due. Plaintiff's contention was that he had overpaid the debt, and that the levy was excessive. The books of the County Court were produced, and his Honour (Judge Meynell), after a careful perusal, found that the balance due to the defendant was not so large as he alleged, and although his verdict was for the defendant, he considered that by accepting the money instead of allowing it to pass through the court by the proper channel, defendant had practically caused the action. Costs would, therefore, be disallowed.

The Diamond Market and Metals.

The Diamond Market.—Latest from the various manufacturing centres report business to be slightly improved ; although (notwithstanding reports as to the prices for rough having fallen) dealers are not very much inclined to pay the prices demanded. The Paris correspondent of *De Diamant* says " the little progress of our market does not call for more than a remark. The high prices appear to maintain themselves and hinder business." Numerous foreign dealers were in the London market during the past month, but owing to the high quotations the business done was not important. The consignments were of the average character. Advices from New York state that market to be extremely quiet, as buyers will not give the high prices asked, besides which it is said that many of the large merchants have sufficient stock to last them for more than a year yet. American experts are of opinion that the present high quotations will not be of long continuance and that the European prices will not obtain in the States.

Metals.—*Silver:* Bars, 47$\frac{1}{16}$d. per oz. *Copper:* Market active. A large business has been done in warrants, £52 10s. to £53 2s. 6d., cash ; and £52 15s. to £53 12s. 6d., three months; closing at £53 7s. 6d. cash, and £54 three months. Quotations : English tough, £58 to £59 ; best selected, £60 to £61. India sheets, £61 to £62. *Tin:* in good demand. Straits, £94 10s. to £94 15s. cash, and £95 to £95 10s. three months ; closing at £94 7s. 6d. cash, and £94 15s. three months.

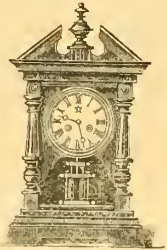
TRADE NOTES

Mayoral Chain for Morpeth.—In place of the old chain which has done duty for the last half century, a committee was formed by the Corporation of Morpeth to procure a new one, and the order was given to Messrs. T. and J. Bragg, of Birmingham. It is a handsome article of solid 18-carat gold, weighing about a pound-and-a-half troy weight, and the badge has been repaired and renewed to suit it. It is of neat and exquisite workmanship, and is of the double-link pattern, presenting an imposing appearance and reflecting the highest credit upon the makers. It is enclosed in a very pretty oak casket lined with blue velvet, and mounted with a brass handle and a plate in centre bearing the following inscription :—"This chain was presented to the Corporation of Morpeth on 22nd April, 1890, for the use of the Mayor for the time being, by the members of the Council and officials. The badge was portion of the old chain. Fred. E. Schofield, Mayor."

Messrs. C. Paillard and Co., of 62, Holborn Viaduct, E.C., have forwarded us their newly-issued supplementary price list of musical boxes, which, together with their regular wholesale price list, forms a complete guide to the trade as regards the purchase of these instruments. The favour with which all new departures in this line are received by the public seems to be continuous and growing, and retailers wishing to stock goods which afford remunerative returns should not neglect any opportunities of keeping themselves informed of what manufacturers are doing. The list before us seems to be very complete in detail and the description of all the latest productions, and, it should be noted, is issued strictly confidentially to the trade only. Our readers can obtain it by writing to the above address.

The City of London Casket for Mr. Stanley.—The following is a description of the casket presented to Mr. H. M. Stanley by the Corporation of the City of London on the 13th ult.:—The casket stands upon a base of Algerian onyx, surmounted by a plinth of ebony, the corners of which project and are rounded. On each of these, at the angles of the casket, stands an ostrich carved in ivory. Behind each bird, and curving over it, there is a representation of an elephant's tusk, looped to three spears placed in the panelled angle of the casket, the pillars of which are of crocidolite, resting in sockets of gold and surmounted by capitals of the same metal. The panels of the casket and also the roof are of ivory, richly overlaid with ornamental work in fine gold of various colours. The back panel bears the City arms emblazoned in their proper heraldic colours ; of the end panels, one bears the tricoloured monogram of "H. M. S.," surrounded by a wreath—emblem of victory ; and the other, that of the Lord Mayor of London. On the front panel, which is also the door of the casket, there is a miniature map of Africa above the tablet, bearing the inscription, "Presented by the Corporation of the City of London with the Freedom of the City to Henry Morton Stanley," which is flanked by a cluster of foliage of mimosa and palm. Above both the front and back panels, on the roof, are the standards of America and Great Britain, so linked as to symbolise the greater United States. On the oval platform, at the top of the casket, is an allegorical figure of the Congo Free State, seated by the source of the river from which it derives its name and to which it largely owes its fruitfulness, holding the horn of plenty, which is overflowing with native products. Messrs. George Edward and Sons, of No. 1, Poultry, E.C., and 92, Buchanan Street, Glasgow, who designed and manufactured the casket, had the honour of submitting it to the inspection of Her Majesty the Queen.

The Torquay Trowel and Mallet for the Princess Louise.—The design of Mr. E. Sermon, jeweller, of Torquay, was selected, from a number sent in, for the trowel and mallet presented to Her Royal Highness Princess Louise on the occasion of her laying the foundation-stone of the new pier at Torquay, on Tuesday, May 6. The trowel is of solid silver, combined with local marble. On the blade, which is of silver, are engraved the arms of the Princess, surrounded with maritime emblems. Below this is a space, in the shape of an escutcheon, for the inscription, with oak and laurel on either side. The handle is of local marble, with silver mountings. At the top are shown the Princess's coronet and the Rose of England, with other suitable decorations underneath. The mallet is of ebony and local marble, with silver mountings. Around the head there is a running border of English rose, below which the handle has a capital formed of Maltese crosses and fleur-de-lis, taken from the coronet of the Princess. The top of the handle is finished so as to match the trowel, viz., with coronet, the Rose of England, and other decorations. On the top of the head is a silver plate for an inscription. Both trowel and mallet are enclosed in a handsome case.



The clock advertised on another page, and also shown in the annexed cut, is the portable electric alarm clock placed upon the market by Mr. S. Naylor, of 12, Corporation Street, Halifax. It is different from anything on the same lines in the market, as the battery is entirely out of sight ; it requires no wooden box or case ; nothing can be seen of the electric arrangements, and there are no unsightly bells or fittings, nor anything to distinguish it from an ordinary clock. As the clocks are every one guaranteed, and are already having a good demand, the "agent wanted in every town" by the patentee should not be difficult to obtain.

Midland Jottings.

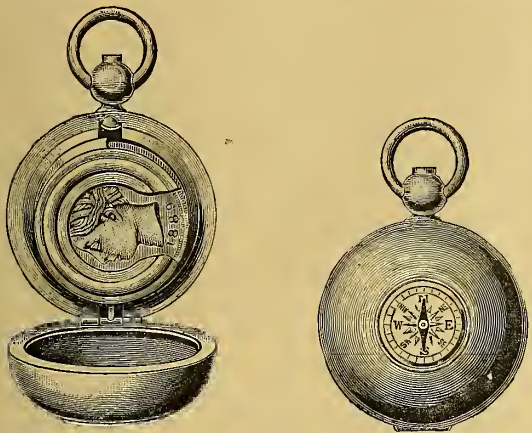
⁂ Correspondence for "Midland Jottings" should be addressed to the Editor at the Birmingham Office, 22, Hylton Street, Birmingham, where it should arrive not later than the 20th of each month.

A dull month with a holiday at the end of it is not the thing best calculated to put manufacturers in a good humour with themselves or their surroundings, and, judging from what we are able to glean as to the state of trade all round, Birmingham jewellers generally have had during the past few weeks some show of reason for the grumblings not a few of them have undoubtedly emitted. Travellers (whether principals or employees) have been obliged in many instances to return from both town and country empty-handed as regards orders. Notwithstanding, however, the numerous disappointments, there is a strongly-felt impression that the present depression is only temporary, and that, in all probability, another month will bring forth a new and increased revival in business.

It would be hard to say whence such impressions spring, but a walk round the trade in the manufacturing districts would show that a "good July" is pretty confidently anticipated. Why it should be, in the face of the past two months' experience, it is not easy to say. Perhaps the present strength of the metal markets has something to do with it. Anyhow, optimism of this kind should not be discouraged.

Last month we had occasion to notice an elaborate silver breastplate manufactured by Messrs. B. H. Joseph and Co., of Frederick Street, Birmingham, for the Sunderland Hebrew Congregation. This gave such satisfaction that the donors, Messrs. Wolfe, have ordered another, which Messrs. Joseph have just manufactured. Like the former breastplate, the design is Moorish, beautifully picked out with parcel-gilding of four different colours. The shield represents the tablets of the Law surmounted by a crown, and is a masterpiece of the silversmiths' art. Both this and the former shield were supplied through Messrs. Rhodes and Sons, of Bradford. Messrs. Joseph appear to be developing quite a speciality in the manufacture of this class of work, for which they are fast becoming famous in the trade.

Following on the lines of their "Eclipse" combination and collapsible drinking cup, Messrs. C. Timings and Son have now brought out another novelty in the shape of a sovereign purse with a compass front. The appositeness of this latter addition to the ordinary sovereign purse will be at once obvious, and we are mistaken if a considerably increased demand for the articles be not the immediate consequence of their introduction to the market. Messrs. Timings are to be congratulated on having, in their enterprising search for novelties, this time hit upon another really useful idea and one that will undoubtedly be favourably received on all sides. These goods are manufactured in aluminum and the well-known "Aftcan" silver, to which latter metal the firm have added a new alloy, which improves it, in so far as it both betters the colour and renders it absolutely untarnishable.



The formal opening of telephonic communication between Birmingham, Coventry, Nottingham, Leeds, Bradford, the Black Country, and the Manchester district was celebrated on the 20th ult. How long is London going to remain behind the times in such matters? The obvious want of such a system between the great distributing centre and our manufacturing districts and towns is becoming appreciated more and more by those who already have the system in use among them, and it is to be hoped that pressure will be brought to bear upon the proper persons until the desired object is gained. Red tape is difficult of disentanglement, but not impossible, and if those interested—and what business man should not be in such a question?—would only keep hammering away at the local M.P.'s, it would not be long before a move was made in the right direction.

The recent charges of bribery and corruption against certain of the Birmingham prison officials have incidentally been the means of calling attention to the prisoner Bromage, the jeweller, who, with his partner Dick, was convicted of fraudulent bankruptcy, and who is at present incarcerated in the Windsor Green Gaol. It is said that since his imprisonment he has lost four stone in weight.

One of the most difficult things for manufacturers to guard themselves against is petty thefts—in some cases more than petty—by employes. In the case of work which is not meant to be Hall-marked it is well known to be almost impossible to detect an ingenious thief without having recourse to such inquisitorial methods as would prove exceedingly irksome, if not unbearable. These thefts, when they do occur—which although, unhappily, often enough, it is creditable to the bulk of the workpeople employed in the jewellery trade (in view of their opportunities) that they are not still more frequent—are further facilitated by the ease with which the metal stolen can be disposed of through the medium of the receiver. It is, therefore, always a matter of gratification when one of these gentry gets "nobbled," and the sincere desire of all well-wishers to the trade is to see him get his full measure of time. Messrs. Hollis and Newman, of Tenby Street, North, are the latest victims to this form of robbery, and both the workman and alleged receiver are under remand.

Mr. Newsome, watch manufacturer, of Coventry, gave his evidence before the Select Committee on the Merchandise Marks Act the other day, following Mr. Hewitt, of Prescot. Mr. Newsome testified to the greatly improved state of the Coventry watch trade since the passing of the Act. He suggested that prosecutions should be vested in the Public Prosecutor, seeing that in many cases people were enabled to brave the law with impunity at the present time, owing to the inability of existing institutions or of private persons to prosecute from want of funds. He thought also that if the name of the maker were placed on the watch it would advantage both the trade and the public.

Dissolution of partnership is announced between Robert Ashby and Alfred M. Barker, trading as the Practical Electro Plating and Enamelling Company, Warwick Lane, Coventry. A fire occurred on the premises of this firm last month, but, although the brigade came out, they were not required, as the ready assistance at hand enabled it to be extinguished by buckets of water. The damage is covered by insurance.

Messrs. Thos. Hill and Co., who have carried on business for more than forty years at Hearsall House, Chapel Fields, have removed to more extensive premises at Spon End.

The Coventry Watch Movement Manufacturing Company has issued its first report and balance-sheet. From this it appears that from January 22, 1889 (the date of the incorporation of the company) to March 22, 1890, there has been a loss of £162 16s. 2d. The directors from the first anticipated a loss on the first year's trading, and in view of the exceptional circumstances attending the formation of the company, and the difficulties which have beset the directors at every step, they consider it a matter of satisfaction that the loss is no greater, it representing only about four per cent. of the paid-up capital. The directors are in hope that with the facilities afforded by the new and commodious factory, and the reduction anticipated in the average cost of working expenses by the use of new machinery, which is now on order, a fair profit may be earned in future. The directors have been somewhat hampered in their operations owing to the comparatively small amount of capital subscribed. They feel that it is of the utmost importance to the well-being of the Coventry watch trade that this company should be in a position to meet the demands of the trade.

SHEFFIELD NOTES

From Our Correspondent.

Mr. Edwin Rippon, a well-known Sheffield clockmaker, died at his residence in Burngreave Road, at the comparatively early age of 58 years. The deceased gentleman—who, at the time of his death, had had the sole control of the town clocks for over twenty years—was an enthusiast in his profession. One clock, of which he was particularly proud, was described in these notes a few months ago. Some years ago he held the office of churchwarden at Trinity Church, and at the time of his death he was a member of the Ancient Order of Foresters, and had passed through all the offices of his own Court. Among other philanthropic movements in which he took part, he was especially interested in the institution of "Hospital Saturday," and for years past has had a special collecting box fixed at his shop door.

The large number of friends who attended his funeral at the Burngreave Cemetery testified to the respect in which he was held by his fellow townsmen.

The annual meeting of Messrs. Martin, Hall, and Co., Limited. was held on May 1, under the presidency of Mr. Bernard Wake. The attendance of shareholders was larger than usual, evidently arising from the recent Government action in reference to the plate duties. The matter was alluded to in the following paragraph in the directors' report:—"An important matter has just occurred by the remission of the silver duty. Down to the declaration by the Chancellor of the Exchequer that the duty was remitted, it was impossible to ascertain what Government would do, and the whole trade was put to much inconvenience by this uncertainty. Your Board are taking the best steps they can to avoid loss. The question of the retention of Hall-marking and the standards is still in abeyance, and it is useless to speculate what will be done. Your Board, however, think it well to record that their strong desire is to keep up compulsory Hall-marking and the standards as heretofore. Unless this be done the value of silver goods can only depend on the honesty and reputation of manufacturers." The subject was then thoroughly discussed at the meeting and the following resolution passed:—"Resolved that the passage in the directors' report with regard to Hall-marking and standards be sent to the county and borough members, with a respectful request that they will be good enough to use their influence to get both principles adopted by Government, it being the unanimous feeling of this meeting that compulsory Hall-marking and the existing British standards result in advantage alike to the manufacturer and to the purchaser."

Mr. H. J. Wilson, M.P. for the Holmfirth division, is a Sheffield silver smelter, and therefore the representations which he made to the Chancellor of the Exchequer the other night in the House of Commons were made with authority. As a smelter he is, of course, strongly in favour of the abolition of the duties. On the other hand, he is at one with the manufacturers in their opposition to the abandonment of compulsory Hall-marking. His expression of regret that Mr. Goschen in seeking information on the subject had gone to the shopkeepers instead of the manufacturers, was quite natural. It is all very well for the general public in a loose colloquial way to call a shopkeeper a silversmith, but a Chancellor of the Exchequer ought to know better. It is probable that his education will be taken in hand between now and the next session of Parliament.

The interest taken in the question of false marking increases rather than diminishes; some people, in fact, seem to have it on the brain. Jno. Wilson, Esq., J.P., for example, must have been in anything but a judicial frame of mind when he publicly accused Mr. J. F. Atkinson, manufacturer and member of the Cutlers' Company, of being "tarred with the brush" of false marking. Mr. Atkinson is one of the searchers of the Cutlers' Company, and was, in effect, accused of fraudulently conniving at false marking on the part of others because it was a practice to which he was addicted himself. Mr. Wilson has had to pay through the nose for this. £200 damages and the expenses of the action is a heavy penalty to pay for exercising the right of free speech. But if Mr. Wilson has lost his money he has gained some experience. He is a stubborn sort of Yorkshireman, and would have taken a great deal of persuading that it was wrong to make such charges without sufficient proof of their truth. Now, however, it will be a comparatively easy task to make him feel that it is not safe to do so. A great practical good will, therefore, have been accomplished, and as Mr. John Wilson is virtuous he will, perhaps, not object to suffer for the good of the community at large.

Another citizen has lost, not only his money but his life, through acting up to a mistaken sense of duty. A silversmith, named Joseph William Downing, was going home one night when he saw some betting men fighting among themselves near a public-house. Trying to stop it, he was himself knocked down and killed. Why some people should consider it a meritorious action to prevent two blackguards from pummelling each other to a jelly passes my comprehension. Even a policeman knows better than that, and judiciously keeps out of the way until each combatant has got his deserts. He then tells them to go home, which they generally do quietly enough. The eighteen months' hard labour which poor Downing's slayer has got will only benefit the general community temporarily—whereas, if the lot had been allowed to kill each other more lasting good would have accrued. Civilisation has its drawbacks, after all.

The transactions of the Sheffield Literary and Philosophical Society, now being printed, contain a verbatim report of the paper read by Mr. Arnold T. Watson, assay master, on the history of the Sheffield office. The paper, which was noticed in these columns at the time of its delivery, may now be studied at leisure. It includes what is virtually a history of the silver trade of the town, and is most interesting reading. What gave rise to the silver trade in Sheffield is more or less a matter of speculation, but it probably originated with Thomas Bolsover, a mechanic, in the year 1743. The straits to which he was put to obtain suitable workmen are curious reading. He was at first forced to accept the services of travelling tinkers, and the riff-raff of York, London, or Birmingham. These were a rough lot, and were not slow to realise their value. It seems to have been no uncommon thing for the workmen in a shop to demand £50 or £100 when they went "on the spree." The father of the present Mr. Austin Nicholson used to say that he remembered two braziers who kept hunters and that several workmen had the hairdresser to attend them with powder in their respective workshops during working hours. The working silversmith of to-day has to be content with fewer luxuries.

The completion of our improvement scheme seems as far off as ever. High Street still blocks the way. As Mr. Gladstone would say, there are three courses open to our civic rulers. In widening the street they may pull down the right-hand side or they may pull down the left side, or thirdly, they may leave the thoroughfare severely alone and make another in its place. It is our inability to make up our minds as to which plan is the best which causes the delay. In the meantime, an enterprising tradesman is buying land on both sides of the street ostensibly to accommodate his ever-growing business. The knowing ones say, however, that there is a good deal of the Vicar of Bray in the transaction, and that whichever plan is ultimately adopted, he will, in more senses than one, be all right.

A walk down Snighill way shows the new jewellery establishment of Mr. Councillor Eaton rapidly approaching completion. The electric light men are running the wires, and a commencement will shortly be made with the fittings. When these are finished, a very attractive addition will have been made to the jewellery shops of the town. By the way, the Sheffield Electric Light Company are putting down new plant, which will give them an additional capacity equal to 2,000 16-candle power lamps. Next winter will, therefore, probably see the electric light in pretty general use in the centre of the town.

Mr. R. Richardson has now moved into the works in Scotland Street, lately occupied by John Harrison and Co., Limited. The cause of the removal was the fact that the Norfolk Street works were only held on lease, whereas Mr. Richardson was enabled to buy the Scotland Street property out and out. To those who know the evils attaching to leasehold tenure in Sheffield the advantages of the change will be apparent. In the meantime the silver trade is expanding in the neighbourhood which Mr. Richardson has just left. Mr. Maurice Baum is taking in contiguous properties and adding to the height of the extended works. Messrs. Mappin and Webb, also in the same neighbourhood, are said to contemplate extensive additions to their works. On the whole, therefore, it would seem that a good many people have faith in the future of the silver trade.

The Watch Trade and the Merchandise Marks Act.

LIVERPOOL WITNESSES.

MR. B. W. Rowson, representing the Liverpool Watchmakers' Association, was examined on April 30 before the committee on the Merchandise Marks Act.

Witness, in reply to Baron de Worms, said that their work was protected by the Merchandise Marks Act to a much greater extent than it ever had been before. The importation of watches bearing English names as well as those bearing no names, but which received English names when imported, had been almost stopped. No doubt, watches still came into this country that were not sufficiently marked. The cases were English and bore the English hall-mark, but the works were foreign. That, however, did not now occur to anything like the former extent. He did not agree with the suggestion that hall-marking should be done away with; but even if it were, they would always be able to detect the foreign article. At present it was necessary that every case should bear the hall-mark, and it was understood that the enactment was based on the supposition that the hall-mark was equivalent to the place of origin. The regulation, however, did not apply to the interior of the movements. Watches that bore the mark of a foreign country were put into cases which bore the English hall-mark, and there was no indication on the case that the works were made in a foreign country. The Act did not prevent foreign works being imported and put into English hall-marked cases. He could mention instances in which the watches were labelled in the windows of the retailers as "Superb English silver lever," etc., but they were entirely of foreign manufacture, excepting the cases, which were hall-marked. He admitted that the persons so exposing such watches for sale were liable to be prosecuted under the Act, but private persons did not care to undertake the prosecution. He thought that prosecutions ought to be undertaken by the Government, who ought also to bear the cost. In one case where watches were seized by the Customs officers at Liverpool, the agents of the consignees sent down a man who marked the place of origin on the dial, but the mark could be rubbed off with the finger, and yet the Customs officers allowed the watches to be cleared.

Mr. Mundella.—You do not complain of the Act. What you want is that it should be more strictly enforced?

Witness.—That is so. We consider that the Act has done a very great deal of good.

By Mr. R. Chamberlain.—He did not agree with a previous witness from Sheffield that small masters should be compelled to put their names on the watches which they manufactured, because in many cases the small masters were the medium of communication between the large masters and the workmen.

By Baron de Worms.—In London, Liverpool, and other places, the small masters made watches for the large makers, and if the small men were compelled to put their own names on them, it would absolutely destroy their own trade.

Colonel Howard Vincent handed the witness for inspection his gold watch, which bore a notice stating that it had been examined by makers to His Royal Highness the Prince of Wales.

Witness.—The case and everything connected with it is foreign.

Mr. Hoyle, a member of the committee, next asked witness to examine a handsome gold watch, which was understood to have been a public presentation to the hon. member.

Mr. Rowson (after inspection).—No, sir, it is not an English watch.

Mr. Mundella next submitted his gold watch, which the witness pronounced "English all through, sir."

Mr. M'Ewan and Colonel Hill in turn submitted their watches, and Mr. Rowson declared them both to be of English manufacture.

Mr. Mundella.—Why, all English on this side of the table.

Mr. Hozier also had his watch examined, and the witness expressed the qualified opinion that it was "Not exactly English; it was British."

Mr. Hewitt, of Prescot (chairman of the Lancashire Watchmaking Company, Limited), stated that the Prescot manufacturers had largely benefited by the operation of the Act; still there was a good deal of smuggling going on. He did not object to small masters, but he was rather inclined to the idea that the makers in every case should be compelled to put their names on the articles which they produced. His company, which had a working capital of £50,000, and had paid a first dividend of six per cent., were endeavouring to do so in every instance; but no doubt they would have a difficulty with the retailers.

By Mr. Hoyle.—They had put down machinery for making not only the movements, but everything connected with a watch. In some instances they could not prevent re-marking. Their policy was to produce a watch which should be understood to be entirely their own manufacture.

By Mr. Howard Vincent.—The tendency of the trade was to get into the hands of the larger manufacturers, and to annihilate small masters. He was in favour of a more strict enforcement of the Act.

Mr. Newsom, representing the Coventry watchmakers, and other witnesses were also examined as to the beneficial operation of the Act, and the necessity for a better enforcement.

The committee adjourned.

Coventry Watch Movement Manufacturing Company, Limited.

THE annual meeting of shareholders in this company was held on Wednesday evening, May 21, at the company's offices, 17, Hertford Street, Coventry. Mr. S. Yeomans, chairman of the directors, presided, and there was a large attendance, amongst those present being Messrs. T. J. Mercer, R. Waddington, C. Read, T. Kinder, E. Denny, E. Welsby, C. H. Errington, R. J. Pike, C. Shufflebotham, S. W. Read, T. Gardner, W. Flowers, Bales, E. T. Peirson (auditor), and the secretary (Mr. E. F. Peirson), etc.

Letters of apology were read from Mr. Rowland Hill and Mr. I. J. T. Newsome, the latter gentleman remarking that he had every confidence in the future of the company.

The report and balance sheet were taken as read.

The Chairman, in proposing the adoption of the report, said that on account of the small amount of capital subscribed, the directors were unable to carry out fully their intentions as set forth in the prospectus, and instead of at once making movements on the "new" lines they had to go upon the "old" lines. The time of starting was very awkward on account of the condition of the labour market at Prescot, and it was with difficulty that workpeople could be obtained. To those they did get they had to give a bonus, which was one of the first items of expenses. There were few tools to be bought, as the Lancashire syndicate, which this company was designed to counteract, had bought them up, and there was really only one person from whom they could buy. They gave £1,000 for his tools, and just as they got into the premises in Hill Cross they found the place too small. Not being able to find other premises suitable, they set about building a factory in Spon Street. With those commodious premises and with the present power, they could extend the trade considerably, but they were very short of capital. They had abandoned the idea of working with the old tools, and intended going upon the lines of the Lancashire Company. It was impossible to go on paying for so much high-priced labour, and it was on account of their expenses being so large that the loss had been sustained. They had to pay the manager the same as if he had 100 men under him, and the rates and taxes were just as high as if they were doing a big trade. It was imperative that they should go on the new lines and get modern machinery to supersede to a certain extent the skilled labour that they at present had to pay for. It was very necessary that this industry should be established in Coventry, the place where the watches were made, but he was convinced that if they were to keep pace with the trade they must employ more machinery, or as a matter of consequence their business every year would get less.

Mr. Waddington seconded the proposition, remarking that everything in connection with the company had been done openly and above board, and the directors had no wish to cover anything up. They already had one or two expensive machines almost ready for use, and the "new" system with them was partially an accomplished fact. A considerable amount of the present plant could be modernised at very little expense, and so be capable of producing a larger quantity of movements for the same payment of wages. The output was considerably in advance of what it was two or three months ago, but it was not what it ought to be. He had no doubt as to the ultimate success of the company, but it would be much easier for the directors to attain the fulfilment of their desires if they had increased capital.

Mr. Flowers asked for the details of the formation, goodwill, bonus, and extension account, which in the balance sheet appeared as £944 13s. 10d.

The Secretary replied that the formation expenses amounted to £194 9s. 2d., for goodwill they paid to Mr. E. Scaresbrick £600, bonuses £107 4s. 5d., expenses of engineer attending to shafting, converting machinery from hand power to gas power, etc., £43 0s. 3d., making a total of £944 13s. 10d.

Mr. Flowers said he understood that there was no trade to take over, and he asked why £600 was paid for that which was not worth a penny to the company.

The Chairman explained that there was no other course open to the directors except to buy Mr. Scaresbrick's tools. As had been stated, they had to pay £1,000 for them, but they were only put down in the company's stock as being worth £400, and the balance was called goodwill. If the directors had chosen they might have put down the whole £1,000 for the tools, but they wished this to be a genuine and not a cooked balance sheet.

Mr. Flowers asked why the directors did not allow the thing to stand in abeyance until they could get tools made, and

Mr. Waddington replied that it was a question of seizing the opportunity at the time, or allowing the watch manufacturers of Coventry to be in the hands of a monopoly for the supply of their movements.

Mr. Shufflebotham said if the step was not taken at the time it was the movement-making trade would have been placed in the hands of one company, and the watch manufacturers would have been at the mercy of that company. Watch manufacturers were even now benefiting by the venture in that they were not at the mercy of the Lancashire syndicate.

The Chairman added that the directors had gained a good deal of experience; and in reply to a question he stated that the company required about £3,000 more capital to carry out all their intentions.

Mr. Errington pointed out that if the company's operations had resulted in a loss to the shareholders, the watch trade generally had benefited by it. They had certainly broken the back of the Lancashire watch company, and he thought the directors were to be congratulated upon getting along so well under the circumstances.

Mr. Peirson said he had been behind the scenes, and could testify that the company had been formed as economically as it was possible for any company to be formed, and no money had been sunk, as was usually the case, with promoters. The directors, although working incessantly for the interests of the company, had not received a penny for their services.

Mr. Bales said the watchmakers of Coventry were very slow, and some people thought this step might have been taken twenty-five or thirty years ago, and so have made Coventry altogether independent of Prescot.

After some further discussion as to the management and mode of manufacture, the report was adopted unanimously.

On the proposition of Mr. C. Read, seconded by Mr. Pike, the retiring directors, Mr. T. J. Mercer and Mr. R. Waddington, were re-elected.

A discussion then took place as to the best method of raising further capital. Further shares, amounting to about £300, were promised to be taken up by those present, and the meeting closed with a vote of thanks to the chairman.

The Budget and the Plate Trades.

THE new Customs and Inland Revenue Bill for giving effect to the alterations of duties provided for in the Budget will, says the *Birmingham Daily Post*, be found of especial interest to our jewellers, silversmiths, and licensed dealers in plate, for whose benefit we print to-day an abstract of the second part, dealing with the repeal of the plate duties. The new law takes effect, it will be seen, from May 1, after which all stamp and Customs duties on gold and silver plate are abolished. The *crux* of the measure, of course, is the allowance by way of drawback on duty-paid stocks, and the provisions with this object constitute the most important part of the Bill. It is clearly impossible to ascertain in advance the extent of the stocks in the hands of manufacturers and dealers; but the Chancellor of the Exchequer, after due enquiry and consultation with the heads of the trade, has apparently been led to believe that the quantity may represent an aggregate duty payment of £120,000, which, if only silver-plate were in question, would be 1,600,000 ounces. As the amount of the annual duties levied upon gold and silver-plate is stated at £80,000, this provision represents just a year-and-a-half's production. Whether the estimate is correct or not, £120,000 is the full amount which will be allowed in respect of old plate, and if the total demands upon the Exchequer exceed this amount they must be ratably cut down. In order to obtain the benefit of the drawback, manufacturers must conform strictly to the requirements of the Bill, and in the first place give notice within a week from this date of their intention to claim the rebate. The plate, it will be seen, must be of English manufacture, and must be *bonâ fide* dealers' or manufacturers' stock, and not returned goods which have been in the hands of the public. The weight, moreover, must be ascertained in the month of June, if the aggregate valid claims made for a return of duty exceed the amount which is at the disposal of the Chancellor of the Exchequer, and this is only too probable, they will be cut down, and the £120,000 distributed ratably among the claimants. Certain rules must be observed in giving notice, both to the Commissioners and officers of Inland Revenue, and full particulars must be given of each article of plate, which must afterwards be produced for examination, together with the stock-book in which it is entered, or some other evidence of the date of manufacture or purchase of the goods. Special arrangements are made to meet the case of those who desire to export duty-paid plate, and payment of the rebate will be made on and after September 1 next, on production of the Inland Revenue collector's certificate, together with a statutory declaration in the form prescribed by the Act. A fine of £500 is imposed for any attempt to defraud by means of false certificates or declarations. It is provided also that traders who have sold plate as duty-paid upon which the duty is now repayable shall either allow a deduction of the amount from the purchase-money he receives, or, if the money is already paid, repay it to the purchaser. These are the essential provisions of the Bill, which seems on the whole well calculated for its purposes, though we fear the amount provided for drawback will fall very far short of the requirements of the case. It will be observed that there is no limitation as to the age of the plate, and there is nothing, therefore, to prevent a silversmith from obtaining the allowance on silver of the date of Queen Anne, if it can be proved to the satisfaction of the Commissioners that it has paid duty, and has never passed out of stock. Claimants, however, must lose no time in formulating their demands in accordance with the requirements of the Act, for they may rest assured that the Government will allow them no grace if their claim is not sent in within the statutory period.

The Gold and Silver Plate Duties.

In an article under the above heading, *Trade, Finance, and Recreation* gives some points which afford some new light to a much-vexed subject.

For a number of years a considerable agitation has been going on in this country for the abolition of the duties on gold and silver plate, and now that Mr. Goschen, in his capacity of Chancellor of the Exchequer, has finally decided to abolish these duties, a great and added interest is felt on the subject by all those who are in any way interested in the trades affected by the impost. As a matter of justice, the tax is one that could not be retained whenever the condition of the revenue would admit of its abolition, and this is fully affirmed by the Select Committee of the House of Commons which enquired into the subject in 1878. The grounds taken up by the Committee for that admission were: "The unequal incidence of the duty, and the great proportion it bore, which was nearly 40 per cent., to the raw material; and also the importance of promoting the use of silver as an article of manufacture." The subject is more or less complicated by its connection with the Indian interests; India has for a long time attached enormous importance to these duties, and the Royal Commission which enquired into the subject not long since recommended without hesitation the abolition of the duties as a practical measure for diminishing the difficulties in India.

Mr. Gladstone and the Duty.

In 1881 Mr. Gladstone, in his Budget, referred to the subject, and said he was favourable to the proposition to reduce the duty gradually. He would have preferred to reduce it immediately, but was prevented from so doing by the amount of the drawback, which at that time was calculated at £170,000. In referring to the matter in his Budget speech, Mr. Gladstone said: "The state in which it was left perplexes the markets, places transactions on old plate on an embarrassed footing, inflicts much mischief and limitation on the industry, and possibly tends to lower the standard of our manufactured goods, while obstructing taste and design."

Mr. Chamberlain and the Silversmiths.

Mr. Joseph Chamberlain, speaking recently at the annual dinner of the Birmingham Jewellers' and Silversmiths' Association, said "the trade remained fettered by the remnants of the old system, the old false system of taxation. They were subjected to restriction imposed by legislation in the shape of a system of compulsory Hall-marking, and also of exceptional taxation. Nobody approved in principle of that taxation, which had been condemned by successive Governments and by successive Chancellors of the Exchequer." That may possibly be the opinion entertained by the silversmiths in the north, but Mr. Goschen, in dealing with the subject in his Budget, recently said it was not pleasant to propose to part with a tax which was paid by the trade with the greatest possible cheerfulness. He added that there was a positive alacrity on the part of the chief members of the trade in paying the plate duties, and that they had protested to him in advance against their abolition. He then proceeded to justify himself in dealing with the duty, and stated that in regard to India, Viceroys and ex-Viceroys in that Empire had all attached the greatest importance to the subject, and that it would create a very serious disappointment in India if the Government did not deal with it.

Wedding Rings.

The greatest portion of the duty upon gold-plating is paid upon wedding rings, which, as Mr. Goschen humorously describes it, was a "most necessary article of consumption," and which amounted to £23,000. No drawback has been proposed in the case of gold-plate, while the amount involved in the case of silver-plate is about £120,000. Immediately the Budget scheme became known the principal manufacturing goldsmiths and silversmiths of London sent the Chancellor of the Exchequer a communication suggesting that the drawback in gold and silver plate should be extended only to goods manufactured within twelve or eighteen months from the date of the repeal of the duty, contending that houses which had an accumulation of old stock were not entitled to the drawback. To this Mr. Goschen replied that he did not see his way to deviate from the main principle of the scheme, which was to allot a maximum sum of £120,000 available for drawback, to be divided *pro rata* among all valid claims.

Parliamentary Action.

The subject of the duties has been taken up in Parliament, and their abolition pleaded for many years by many different members. Lately, Mr. Bradlaugh, who takes a deep interest in anything that affects our Indian Empire, has given his attention to the matter, as has also Mr. Henry Kimber, the popular and zealous member for Wandsworth, and both these gentlemen have sought the aid of the ballot, but without much success, in bringing on a discussion on the subject in the House of Commons. Upon one night recently there was a good chance of bringing up the question on a private members' night; but the Government necessities intervened, and the opportunity was once more lost.

A representative of *Trade, Finance, and Recreation* recently saw Mr. Henry Kimber, M.P., in the lobby of the House of Commons, and obtained from him his views on the whole matter, as well as his opinion as to the effect the abolition of the duties would have upon trade.

"As regards the duties," said Mr. Kimber, "in my opinion they are

Taxes on Trade,

and therefore, so far as they go, are a hindrance to that free trade which England has adopted, and upon which we live."

"What is your opinion," asked our representative, "as to the effect of the repeal of the duties on the Indian currency question?"

"The repeal of the duties, especially that on silver, will in my belief indirectly assist the rupee question between India and this country, in which the depreciated value of the silver rupee, following the lowered value of silver as a commodity, produces such loss by the adverse rates of exchange upon our enormous remittances from that country. Besides, we must not forget that India is

Our most important Foreign Possession.

By the repeal of the duties the manufacturing industry in silver will be stimulated and cause a greater demand for silver, and so raise its market value as a commodity, in which case the exchange value of the rupee will naturally rise in the same proportion. The duty only produces about £75,000 yearly, and it may or may not have been the cause of

Crippling the Silversmiths' Art

in this country. At any rate, all efforts that have been made to revive the art have been, so far, wholly unsuccessful, although the Goldsmiths' Company has done its best to encourage competition and to stimulate taste in design by offering rich prizes to competitors. The difficulty hitherto in the way of a removal of the duties has been the necessary payment of something in the shape of a drawback on work already manufactured. But of recent years even the manufacture of silver spoons and forks has been so reduced that it is believed the amount proposed by Mr. Goschen will almost satisfy all the claims for unsold stock which have been legitimately put forward by manufacturers."

Continental Practices.

"In this connection an important paper was recently presented to Parliament giving details of the practices of foreign governments in the matter of duties, assaying precious metals, and Hall-marking, with the various standards of quality in use. These particulars should be of the greatest interest to all connected with the manufacture of the precious metals."

The Result of the Abolition.

"What do you think will be the effect on the trade of the proposals made by the Chancellor of the Exchequer?"

"I think the abolition of the gold and silver-plate duties one of the most excellent parts of Mr. Goschen's Budget. Its good effect cannot be measured by the mere amount of taxation remitted. It will, I think, give a stimulus to trade and art industries to ten times its amount."

Hall-Marking.

"What is your opinion upon Hall-marking, Mr. Kimber?"

"I think to complete the liberation of the arts and manufactures it is necessary not to abolish Hall-marking, which is a good brand and useful to those who require a warranty; but it should be made voluntary and not compulsory. All the people who like to have their silver tested by assay and Hall-marked (and many will always do so) could have it done and would pay accordingly for any additional value thereby given to it, but there are people who are content with gold and silver unmarked and of a lower standard of quality, and why should they not have them?"

Free Trade.

"It is surely another restriction on trade to prevent anybody dealing in or making any article they like in whatever kind of material they choose. There are many uses, I believe, to which silver may be put if allowed to be worked at a lower purity than the standard. England cannot afford now-a-days—whatever else she might have been able to do years ago—to do anything to lessen or restrict trade of any kind between us and any other country, especially our own possessions, nor to do anything to restrict manufacture. Too many of us live on it to be able to do without our external commerce, while the internal produce of our country would not keep one-half of us alive."

An Expert's Opinion.

Our contemporary's representative subsequently waited on Mr. E. J. Watherston, of Pall Mall, whose notions are pretty well known to the trade.

"Yes," said Mr. Watherston, "the plate duties are gone, but the agitation is by no means ended as a result of Mr. Goschen's Budget. He has failed to abolish 'compulsory' Hall-marking. Mind, there is no desire on the part of anyone to abolish Hall-marking; on the contrary, the desire is to strengthen its position in this country, under a voluntary system. It is not generally known that Hall-marking in the United Kingdom is partly a compulsory and partly a voluntary system. All wares not in the list of exemptions in the Acts applying to the duties must be of British standards, and they must be Hall-marked. Practically jewellery is exempted, and the fine for the infringement of the law is £50."

Objections to Compulsion.

"The objection to the compulsory system is unanswerable. It prohibits the exportation of silver-plate to any foreign country, unless they are prepared to take our British standard and our Hall-mark. But foreign countries want neither, seeing they all have standards of their own, and, as a rule, we do no Continental trade whatever. Even Canada, though approving of our standard, will not accept our Hall-mark, because, when we did business in Canada, some American makers forged it, and applied it to inferior goods. But though the export door is closed to British enterprise the import door is wide open. Though foreign countries have strict systems of marking for their home trade, their manufacturers are allowed to make what they like for exportation, and our Hall-marking facilities are as open to foreigners as to our own manufacturers. In addition to this, by the Revenue Act of 1884, foreign plate of 'Oriental' design was specially exempted from the obligation of assay in the United Kingdom, and is therefore under a voluntary system. If up to British standard it can be marked; if not, it may be sold at its merits unmarked."

Oriental Plate.

"Indian plate will, if sold at all, sell on its artistic merits. But we make plate of Oriental design, as do also Japan, France, India, and notably America. Anyone can make it, so anyone is protected against the British manufacturer. It is protection the wrong way round. Imports are encouraged and exports prohibited, except under such conditions as render trade impossible. In 1878-9 Mr. Goschen led the free-trade fight against the duties and against the principles of compulsory Hall-marking. Now he refuses to abolish compulsion, and proposes to institute a new standard for Indian manufacturers who use rupee silver of fineness ·916 as against our ·925. This would be of no use to India, as the native workmen use solder in different degrees, and thus the quality of Indian silver-plate varies immensely."

Future Action.

"I do not know yet how we shall proceed in the House of Commons when the Revenue Act comes up for second reading. I am afraid a simple amendment would not be in order. But as the Government took our night, and prevented Mr. Bradlaugh from moving his resolution, when the whole question would have been raised, I think the Government should offer Mr. Bradlaugh another opportunity. I am convinced when the House understands that the export door is closed to British enterprise some way will quickly be found in order to open it."

Proposed Enlargement of the Birmingham School of Art.

THE Committee of the School of Art have presented a report to the City Council recommending the acquisition of vacant land adjoining the Central School, in Cornwall Street, for the purpose of the extension of the building. The committee have for some time past been impressed with the necessity for this measure, owing to the increasing pressure of students, and to the demands for additional space arising from the gradual development of the subjects taught in the school. The present building is now occupied to its fullest capacity, and is at special periods, such as examinations, found to be seriously inadequate in regard to requirements of space and organisation, the ordinary work of the school being at such times greatly deranged and impeded by the influx of students for examination purposes. The means of enlargement are afforded by a piece of vacant land fronting to Cornwall Street, and occupying the space between the school and the Parish Offices. Mr. Cregoe Colmore the owner of the land, has received several applications for it for building purposes on lease, but has, at the request of the committee, abstained from letting it until they have had an opportunity of applying to the Council for permission to acquire the site for the extension of the school. It has now become necessary to arrive at a decision on this matter, as Mr. Cregoe Colmore does not feel justified in permitting the land to remain any longer unused. The area of the land is 968 square yards. It has a frontage of 120 feet to Cornwall Street, and a depth of 67 feet adjoining the present school, and of 78 feet adjoining the Parish Offices. The area occupied by the present school is 1,053 square yards. This site, as the Council are aware, was generously given by Mr. Gregoe Colmore. He does not see his way to add to this donation, but, having a high appreciation of the work done by the school, he has consented to let the additional land on lease for 99 years, at a lower ground-rent than the amount which private persons are prepared to give, and he has liberally offered a donation of £1,000 towards the cost of the extension of the school buildings. The rental of the land, 968 square yards at 5s. 6d. per yard, would amount to £266 4s. per annum. The committee have had prepared approximate plans for the extension, and estimates of cost. The probable outlay for building and fittings would, according to these estimates, amount to about £13,000, provided that the whole of the work is undertaken at one time. Reduced by Mr. Cregoe Colmore's donation of £1,000, and by a probable grant of an equal amount from the Science and Art Department towards the cost of building and fittings, the net amount of outlay would probably be about £11,000. Including rental of land, repayment of loan for building, additional teaching and administrative expenses and contingencies, and deducting the estimated increased fees receivable from additional students, and the estimated increased Government grant, the committee estimate that the net annual cost of the school would be augmented by about £1,500. It is possible, however, that the whole of the contemplated new buildings need not be erected at one time, and in that case, pending the full development of the plan, the annual cost would be proportionately reduced; but the committee think it desirable that, in order to enable the Council to form its judgment on the proposal, the whole scheme of extension should be frankly laid before it. The committee, in indicating the extensions now absolutely necessary, point out that the following class-rooms are too small:—The elementary room, which at night is often inconveniently crowded, and hindrance to study arises from the fact that the instruction in freehand from the blackboard and the short lectures in elementary design, given in this room, have to be delivered before students who are proceeding with other work and under the teachership of a different master. The lecture-room is unable to seat the large number of students in attendance at the evening lectures in geometry and perspective, the architectural-room having therefore to be occupied by them on one evening a week. The machine-room is already full, and an increase of students is expected. Several new rooms are needed, including an examination room, for the want of which class-work has often to be suspended through the influx of students attending examinations, while the use of rooms elsewhere has frequently to be obtained. A suitable room is also required for the valuable art library, at present inadequately housed in the curator's office; and the existing accommodation for the storage of examples of students' works, etc., is inadequate. Owing to the extreme importance of modelling as applied to Birmingham manufactures, and to the recent development of the modelling department, it has now become absolutely necessary to extend that department by the addition of a room for the casting and baking of models. Hitherto the casting and baking have been done away from the school, and most valuable instruction has thus been lost. The necessity of extension is demonstrated by the annual increase in the number of students. In addition to the entry of students previously unconnected with the school, the development of the branch schools must result in a considerable accession of qualified students at the central school. The committee give in tabular form a return of the numbers of students at the central and branch schools since the autumn term, 1884. It shows that during the autumn term of 1888, 2,646 individual students were in direct connection with the school; a total increase of 667 on the number for the autumn term of 1887, of 1,059 on that for the autumn term of 1886, and of 1,800 on the number for the autumn term 1884. This rate of increase is maintained by the experience of the current year; and as the branch schools are further developed, it may be expected that a still greater measure of progress will be realised. In order to enable the Council to appreciate the magnitude and to estimate the value of the work which is already being done, and of the great results which have followed the transfer of the School of Art to the Corporation, the committee have prepared a general statement, pointing out that the work begins with the lowest standard in the boys' departments of Board schools within the city, the committee having entered into an agreement with the Birmingham School Board for the general supervision, by officers of the school, of the teaching of drawing in all the boys departments of Board schools. The art instruction given in the Board schools is thus pursued on the same lines as in the central and branch schools of art; and one of the greatest advantages of this system is that a boy, after leaving a Board school and on joining one of the schools of art, is able to continue his art studies just from the point which he reached at the Board school. There are eleven branch schools of art—ten of them held in Board schools in different parts of the city, and one in the Vittoria Street School building, the acquisition of which was lately authorised by the Council, and which will be opened in September next. The fee for attendance at a branch school, on five evenings a week throughout the school year, is 5s. 6d.; and, in addition, a drawing-board is provided free for each student. There is thus a branch school within easy reach of every part of the city; and the fee for attendance is so low as practically to exclude none. At the central school, morning, afternoon and evening classes are held on five days a week, for forty weeks in the year. The curriculum includes all branches of drawing, shading, painting, design, and modelling, geometry, perspective, and sciography; architecture and building construction, machine construction, and the steam-engine. Apart from the ordinary class meetings, twenty-eight lectures on different branches of art are every week given in the school. As to the class of students in attendance, all the students of the branch schools are artisans; and the great majority of them directly apply to their trade the knowledge which they acquire in the classes. Most of the students of the central school also are artisans. The students there include architects, builders, designers for all local manufactures, artists in stained glass, brass-workers, die-sinkers, modellers, lithographers, draughtsmen, machinists, persons in training to become art teachers, etc. At the Ellen Street branch school a special class, taught by men who are at once qualified art teachers and practical jewellers, and now numbering 155 students, has been opened for the employés of members of the Jewellers' and Silversmiths' Association; and over 300 female pupil and candidate pupil teachers, under the Birmingham School Board, receive instruction in drawing at the Bristol Street branch school. Much help is given to deserving students by the schemes of free admissions and scholarships. At the present time there are 352 free admissioners to the branch schools under the scheme for the award of free admissions to pupils of all public elementary schools within the city; 26 free admissioners, under the "Middlemore" bequest, to the evening classes at the central school; the following free admissioners and scholars under the scheme provided by the late Miss Ryland—namely, 40 free admissioners to the branch schools, 70 to evening classes at the central school, and fourteen scholarships with free admission to the central school, of a total annual value of £170; and one scholarship, with free admission to the central school for three years, given by Messrs. Richard and George Tangye, in memory of the late John Skirrow Wright, and of the total monetary value of £180. It will be thus seen that all the rate-aided art instruction within the city is now controlled by the School of Art Committee, that there is abundant evidence of the necessity for an extension of the central school, and that the work of the school, affecting all classes of the community, has not only a great educational influence upon the city, but has a direct bearing upon the value and prosperity of the manufactures of the district. Indeed, the scope of the work done gives the school a position absolutely unique in England.

Conference of the English Watch Trade.

A CONFERENCE of representatives of the various centres of the English watch trade, including London, Prescot, Coventry, and Liverpool, convened by the London Watchmakers' Trade Association, was held at the rooms of the London Chamber of Commerce, Botolph House, Eastcheap, Captain F. T. Penton, M.P., presiding. On the motion of Mr. S. A. Brooks (London), seconded by Mr. J. Berry (Prescot), it was unanimously decided to form a central executive council, consisting of three members and the secretary from each local Association, to whom all questions of difficulty in the trade could be referred. Sir A. K. Rollit, M.P., chairman of the London Chamber of Commerce, expressed his belief that the watch trade of London and of the country had very materially improved as a consequence of the clauses relating to watches inserted in the Merchandise Marks Act of 1887, but it was found that a heavy cost and much trouble were imposed upon the London Watchmakers' Trade Association in instituting prosecutions in cases of fraud. The duty of prosecuting under the Act should, it was felt, devolve upon a department of the Government, and he urged the conference to support the Bill of Mr. Mundella, which would impose this duty upon the Board of Trade. Mr. Macfarlane (London) moved a resolution which declared that the place of origin of goods should be distinctly marked upon them. The motion having been seconded, a rather animated discussion followed. Mr. Rowson (Liverpool) stated it was the habit of his firm to get watch cases from London, and they manufactured watches which bore, not their name, but the name of their customers, the actual retail vendors of the watches. Of course, if a watch bore the name of a Manchester firm of shopkeepers, the people were not green enough to imagine that the watch was actually manufactured in that city. It was ultimately decided that the question raised by the resolution should be considered by the executive council. A resolution was unanimously adopted in favour of Mr. Mundella's Bill to amend the Merchandise Marks Act, and Mr. S. A. Brooks (London) was appointed to represent the conference before the Select Committee now sitting to inquire into the working of that measure.

Fortunes in the Crucible.

"JUST wait while I granulate some silver," a John Street refiner said the other afternoon to a *New York Times* reporter, who had called upon him in his dingy little basement and asked him to reveal some of the interesting features of his trade. "It will only take a few minutes, and if you care to see the operation, come along." Although the reporter's technical language may frighten a refiner, his description of the process will interest the jewellers.

The refiner led the way to the back part of the basement, where one of three brick furnaces was sending a pleasant glow through the red-hot lid which closed an opening in its roof. This lid the refiner shoved aside, and, peering through the opening, the reporter saw a crucible surrounded by coals burning at a yellow heat and filled with a trembling liquid, in which were some metal articles whose shape had not yet been entirely lost. One was, very clearly, a small box. Another looked liked the ghost of a baby's birthday spoon; a third faded away before the mind could well determine what it resembled most, and then suddenly the ghost of a spoon and the box vanished, and all the crucible contained was a quart or so of sparkling, dancing liquid with a trifle of thin scum at its edges. The refiner tossed two little bits of borax into the crucible, and then the scum disappeared. Then he replaced the lid of the furnace and selected one of several pairs of queerly-shaped tongs ranged against the wall behind him. With this he in a moment lifted the crucible from the fire and poured its contents slowly into a large tin vessel filled with water.

Five minutes later his assistant, to whom he left the remainder of the work, brought to the front part of the basement a frying-pan full of what, though much brighter, looked like those irregular-shaped lumps of lead which superstitious young people smelt on All Hallowe'en in the hope of striking the coming true love's initial.

"This," said the refiner, as he lifted up a handful of it and held it to the light from the street, "is fine silver, such as I sell to the jewellers. There are about 150 ounces of it there."

"And before it went into the pot, what was it?"

"Quite a variety of articles went to produce that lot. Let me see: there were two snuff-boxes, five watch cases, a baby's spoon, three spectacle cases, two babies' mugs, some mutilated coin, four medals, some family plate, supposed to be sterling silver, but in reality only plated ware; four chains, a couple of finger rings, and sundry other things which I cannot call to mind. Look in any well-stocked pawnbroker's window and you will get a correct idea of what, in the shape of old gold and silver, comes to us to be smelted down into merchantable metal."

During the talk which the reporter had with the refiner, he learned that the business of converting old-fashioned, worn-out and broken articles of jewellery and other manufactured forms of the precious metals into bullion is a very important industry, hardly a large city in the east being without its refinery. "The centre of the business is undoubtedly this city," the refiner said, "most of the big establishments being on John Street or Maiden Lane, but Newark is well supplied too, and so are Chicago, Philadelphia, and Boston. All the year round the supply of old gold and silver ware and jewellery keeps coming in to these places from all parts of the country. Every city of any importance sends along consignment after consignment of the stuff, and still it seems to be inexhaustible, and there are large and wealthy firms which do no refining, but confine themselves solely to the work of accumulating the stock. These are known to the trade as dealers."

The rapidity with which the fashion in modern jewellery changes is the principal cause of this lively trade. The heirloom fancy has no application to jewellery nowadays. A grandfather's clock may, now that that dreadful song is no longer heard, inspire a dutiful grandson with feelings of veneration or even affection, but a grandmother's watch, or still worse, her earrings or long neck-chain, would not fail to be greeted with a disdainful toss of the head if offered to a granddaughter advanced in her teens. In ten years, at the most, an article of jewellery will have gone out of fashion, and, however regretfully, it goes sooner or later to the refiner's pot.

The jewellers, who, next to the pawnbrokers, are the most active caterers for the refiner and dealer, promote the retiring of old jewellery whenever an opportunity offers. A customer brings in an old watch to be repaired. In ten minutes the jeweller has persuaded him to part with it for what its metal case will bring as part payment of a new watch. The sale made, the jeweller puts the old works into a cheap modern case, and adds the old case to the collection of gold and silver ware which he is making for the refiner. This is a profitable transaction for the jeweller, who generally sells the combination of old works and new case at a fine profit. Other things which go to the jeweller's scrap box are broken jewellery, odd parts of sets, worn-down finger rings, medals won on the battle-field by soldiers, or on the cinder path by amateur athletes, marred pieces of gold and silver ware of all descriptions.

A large majority of the unredeemed pledges left in the pawnbrokers' hands are ruthlessly turned over to the refiner. The bulk of the jewellery taken to him is old-fashioned. It is taken to him for that very reason, and the loans made are always based simply on the value of the articles as old gold or silver. They will be even more old-fashioned by the time the pawnbroker is free to do what he pleases with them. Both he and the jeweller keep a keen eye open to the chance of becoming the possessor of an "antique" piece of ware, but this cuts no figure in the dealer's and refiner's calculations. All that comes to his net is simply so much out-of-date, unserviceable metal. And there is another consideration which keeps his curiosity regarding his purchase at a low ebb. He conducts his business purely upon a "no-questions-asked" basis. He does not go prying here and there for an initial that might reveal a clue to a recent well-advertised burglary. He has the highest authority for his policy of discretion. The Government does business on the same plan. It receives by express from anybody who chooses to send it, gold and silver stock at any of its mints and assay offices, and it returns full value for it to the name and address given by its customer. It never attempts to go behind the returns. This is thoroughly well understood by thieves, who having taken the precaution to batter their gold and silver spoils into shapeless masses of metal, invariably send them along to the Government for treatment in preference to a private establishment.

While the reporter was accumulating information from the refiner, one of the latter's customers entered. There was nothing about him to indicate that he was engaged in any particular line of business, but the refiner said he was a jeweller. He said nothing, but drew from his pocket a piece of dark-coloured metal of an irregular circular form, and of about the size of a five-dollar gold piece, but thicker, and tossed it on the counter. The refiner took it up, filed one of its edges until the bright yellow shone out, and then rubbed the exposed edge against a small black stone, leaving upon it a line of colour. Upon this he placed some nitric acid. He held the stone up to the light, and watched closely the action of the acid upon the trace of metal. It darkened slightly. The young man threw down a smaller piece of metal, which was treated in the same way. This piece gave a better result, the colour preserving its brightness. The refiner weighed both pieces, told his customer that the larger one was of ten-carat gold and worth 4 dollars 80 cents, and that the smaller was eight carats fine and worth 1 dollar 84 cents. The customer nodded, took his 6 dollars 64 cents and vanished.

"A very simple transaction," the reporter suggested.

"Very. I found the purity of the gold he had to sell by the usual test. These acids, that little stone and the scales are all that are needed in the dealing part of the business, no matter upon how large or small a scale it is conducted. These test stones are of a peculiar kind, and are found only in the beds of rivers. We buy at about 4 cents a carat, and the result is the following standard figures : 8 carats, 32 cents per pennyweight ; 10 carats, 40 cents ; 12 carats, 48 cents, and so on up to 24 carats, which is 1 dollar per pennyweight. The larger lump I bought from that customer was of 10 carats fine and weighed 12 pennyweights ; the smaller lump was 8 carats and weighed 5¾ pennyweights."

A Maiden Lane dealer, who confines himself entirely to buying precious metals, which he turns over to the United States assay office for reduction, told the reporter that New York's business in his line was in bulk far ahead of that of any other city. His agents were situated all over the country, and the supply from all of them was constant. "Strange to say," he said, "the liveliest business with us is when times are good. That is, because when people are making money, they get rid of their old-fashioned jewellery quickly. When times are dull they make up their minds that the old articles will do. I can tell how general business is in the country at large, or in any particular part of it, by the way the old jewellery comes in to us.

"Just now trade with us is quite brisk in all directions. I get practically all my refining done at the United States assay office, which, I believe, does more business than all the private refineries in the city together. I do business mostly by agents, and by purchases made from the jewellers and from pawnbrokers of the city, but occasionally we do business directly with private individuals, and sometimes with very unreasonable ones. As a general rule, the owner of a piece of jewellery has a very poor idea of the value of the gold or silver it contains. To him all gold is twenty-four carats fine, and all silver is sterling. I have sent people away in high dudgeon at being told that sterling silver which the family has been guarding jealously for years, is of such poor quality of plate that it would not pay to reduce it. When you explain to a woman that the gold in her proffered jewel is only twelve carats fine, and worth only half its weight in pure gold, less the moderate profit required by the dealer and the cost of smelting, she is never able to conceal her contempt. We buy anything which contains gold. Many of the refiners do a lively business in getting the gold from the sweepings of jewellers, engravers, gilders, and lettering establishments. These sweepings are carefully kept, and the amount of gold which they produce is astonishing. Even the water in which the artisans in these places wash their hands is carefully preserved and turned over to the refiner."

The enormous extent of the business of refining the old gold of the country is shown in Secretary of the Treasury Fairchild's report for 1888, in which he says that while the production of gold from the mines of the country in that year was 1,604,841 fine ounces, the product of thirteen private refineries, including unrefined gold (old gold sent by dealers), in the United States mints and assay offices, was 1,666,568 fine ounces. To the latter figures must be added the sum of the work done at the smaller refineries, no insignificant amount, which swells the gold product from old jewellery, etc., to considerably above that of the mines, which generally are regarded as almost the entire source of the precious metal.

Where and How Diamonds were Mined in Brazil.

DIAMONDS were first found in Brazil near the Jequitinhonha River, in Minas Geraes, which then received the name of Diamantina. The story goes, according to a contemporary, that the supposed white pebbles had long previously been noticed by the gold washers, but their value was not dreamed of. It is said that the Indians used them in a game which had some resemblance to dice throwing, and that the children of the miners employed them as "jacks," a game practised by the youth of all countries. It is certain that diamonds were first discovered in gold washings near Diamantina, and that they are to this day found in *cascalho* which also contains gold. The detection of the precious character of the before despised "white pebbles" was due to a Portuguese miner, who had been in India, and had there seen diamonds in the rough. When the news reached Portugal the Crown immediately took measures to monopolise the region. All washing for gold was prohibited in the locality and an intendente of diamond mining was appointed, who exercised perfectly absolute authority over a large area where it was supposed the precious stones might be found.

Ingress and egress were prohibited, except to those having permits from the intendente, and troops were stationed all around, and the strictest rules rigidly enforced. No one could come or go without being searched, even the handles of riding whips being split, to see if they had been hollowed to secrete diamonds therein. The penalty for smuggling diamonds was death, and all dealing in them was prohibited under the same penalty.

Slaves were bought or hired on royal account, and the new mining business was carried on upon a vast scale. At the outset the diamond dealers of the world refused to believe that diamonds were found in Brazil, and the genuineness of the stones brought thence was disputed. Consequently, Brazilian diamonds could not be sold in Amsterdam and London, then as now the chief diamond marts of the world. The Portuguese were equal to the emergency, and carried the Brazilian diamonds to India, where they were sold as the product of old Indian mines and carried thence to Europe and disposed of as real Indian gems. The trick was in due time exposed, when all the lapidaries of Amsterdam and London had been deceived.

The region where they were found forms part of the Serra do Espinhaço, and it is the opinion of competent authorities that throughout the extent of this mountain range, over a distance of 800 miles, diamonds will continue to be found. They have been found in North-western Bahia, where the serra flattens out into a broad *chopada* in a formation radically different from that of the Jequitinhonha. The distance separating the two localities is more than 500 miles.

In the diamantina region of Minas Geraes the diamonds are found in *cascalho*, the sheet or layer of gravel of almost universal occurrence in Brazil. The precious stones are always accompanied by peculiar pebbles, called the slaves of the diamond, which are readily distinguished by experts. At Sencoes, in the province of Bahia, diamonds were found in a sandstone formation, and some in round holes in the sandstone rocks which had been worn by the action of water. These pockets are common in great sandstone formations and are termed "pot holes." Apparently they are worn by the joint action of water and hard, round stones, known as "nigger heads." I believe that diamonds are still found in the neighbourhood of Sencoes, but valuable gems have not been reported for several years.

In the Jequitinhonha region the gravel in which diamonds are found is invariably of the metamorphic quartz or schist rock. The same is true of the accompanying gravel in Rios Claro and Cayapo of Goyas and the diamond mines of Matto Grosso. The Minas Geraes diamond fields have yielded over 100,000,000 dols. worth of stones. The famous Braganza, Abaéte, and Estrella do Sul diamonds were found in Minas Geraes. The Braganza was found in 1741 in the mine of Caéthe Merim, and is one of the Crown jewels of Portugal. It is larger than a hen's egg, but as it has never been exhibited and lapidaries of undoubted competence have not pronounced it a real gem, doubts are entertained as to its true character.

The Abaété was found in 1791 by Antonio Suza, José Felis Gomez, and Tomaso da Suza, who had been exiled to the far west of Minas Geraes for some offence. They were washing gold in the Abaété River, one of the small tributaries of the Sao Francisco, and found this diamond, which weighed 144 carats—nearly one ounce. They bartered it for their pardon from the Government through a priest. The Abaété is also among the Crown jewels of Portugal.

The Estrella do Sul was found in 1853 by a negro woman at Bogagem, in Minas Geraes, and weighed before cutting 254 carats. The negro woman sold it for 15,000 dols. The Bank of Rio de Janeiro bought it for 150,000 dols. It was reduced to 125 carats in cutting, and was bought by the Khedive of Egypt. It is not perfectly white, but its "fire" makes it one of the finest gems in existence.

Three years ago, two natives, while panning gold in a little stream in the north-western part of the province of Sao Paulo, near Uberaba, found a diamond which weighed in the rough state 30 carats. It was pure white and sold for 30,000 milreis—17,100 dols. The four points at which these diamonds were found are widely separated. There is no record of any other diamond having been found in the neighbourhood of Uberaba, which is on the southern water-shed, several hundred miles south of the Abaété and Jequitinhonha basins.

The method of gold mining employed by the Portuguese miners was that of the ancient Romans, and the diamond washing that of the Hindostanese. They began in India in January, after the rains had ceased, and the waters of the streams ran clear. They carried the diamantiferous gravel in baskets on their heads into a low walled enclosure with little drains to carry off the water, which was led into the *batedor*. The mass, after a few days, became mud, when more water was turned on and soil was piled on top of the mud to press it down. Then the drains were opened and the earthy matter was allowed to flow off. The remaining mass of gravel was again covered with water, and this being drained off, the gravel was sifted through baskets to get rid of the fine sand. The coarse gravel was raked and beaten with long stones on wooden pestles. Then there was a resifting, a respreading, and then collections into heaps, and experts slowly picked over the gravel to find the diamonds.

In Brazil the Portuguese began diamond washing about November. Long troughs were used into which the *cascalho* was thrown, and water was thrown on by hand either with a rude wooden shovel or bowl. The mass when sufficiently wet was stirred with the hands and the light soil allowed to float off. When the water ran clear the panner went to work with his *peruira* and *batea*, the former a wooden bowl with a tin bottom rudely punched full of holes, the latter the gold pan, the wooden bowl having a central depression in the bottom.

The gravel was scooped up in the *batea*, a little sand and water were added, and the usual panning process was continued till only the pebbles, recognised as stones of the diamond, were left in the bottom. Then the sifting began with the bowl with the pierced bottom, the siftings being caught in the *batea*. An expert washer would in a half or three-quarters of an hour get through with a panful of gravel. If any diamonds were found they were discovered by the naked eye and picked out, not even magnifying glasses being used.

There is no regular diamond mining carried on now in Brazil, but the natives in the interior wash occasionally in this old-fashioned way, and a good many diamonds are found, but great secrecy is observed, the work usually being carried on surreptitiously on other people's property. There is no enterprise in the interior, and nominally diamonds are the property of the state, and only those who have the right conceded to them can wash or mine for them.

Whether or not mining upon an extensive scale would pay I cannot pretend to say, but certain streams in Minas-Geraes about twenty years ago were explored upon an extensive scale, and with rather crude appliances, but the result was on the whole profitable. There have not yet been found in Brazil regular deep mines, as in South Africa, with a great diamond—containing mass. Here the *cascalho*, as in India, is the result of disintegration—glacial or the elemental process we see constantly going on. In Africa the containing mass is blue clay, evidently volcanic in its origin.

Diamonds and Dynamos.

WE have already dwelt, in a general way, upon the substitute of electric force for muscular and steam labour in industries. We may now take an illustration from a fine industry in which London, once upon a time, excelled the world, and in which, after a long period of decadence, it promises to re-assert its supremacy. We mean the delicate work of cutting and polishing diamonds. In this industry several European towns have at different periods excelled their rivals. Bruges was perhaps the chief seat of the industry in the later part of the fifteenth century; it was a master craftsman of Bruges who discovered the art of cutting facets. At a later period Venice appears to have been the chief seat of the trade. The London workmen were famous in the seventeenth century. In the eighteenth they appeared somehow to have lost their cunning. They were gradually superseded by the craftsmen of Antwerp, but above all, of Amsterdam. Amsterdam has since then been the headquarters of diamond-cutting; and its Diamond Cutters' Association, or Trades Union, is the most powerful body of its kind in existence. Within the last twenty years France and Germany have been making progress in the diamond-cutting industry, but Holland still holds the leading position; and to Amsterdam and Paris are sent quantities of orders from London, for the execution of which there exists abundance of real (though undeveloped) talent at home.

Messrs. Ford and Wright's display of jewellery at the Colonial Exhibition was, says the *Daily News*, an illustration of what English skill could accomplish, and of the revival of which we have been speaking. It was a remarkable display, alike on account of the kind of mechanical force used, and of the opportunity given to visitors of observing the process of manufacture from beginning to end. The "mills," as the cutting and polishing discs are called, were turned by an electric motor, a small, compact machine sufficient for the needs of twenty workmen. This was the first application of electric motive force to gem-cutting in England, and up to date it has been the only one. The reason of this will be evident from what we said in a former article. Not until central stations for the supply of electric motive power are established will craftsmen in this or any other trade substitute electricity for steam and gas engines. The advantages of the substitution are obvious. Electric force is unaccompanied by the noise and vibration which must render steam power more or less inconvenient in the case of such delicate work as the cutting and polishing of precious stones. In the second place, it is much less wasteful. Between the driving wheel of a steam-engine and the "mill" of the cutter and polisher, a large proportion of force is lost in its transmission through belting and gearing. Again, the initial velocity of an electric motor is much greater than that of a steam-engine, and this is a very serious consideration to the craftsman, whose cutting and polishing disc must be kept at the high speed of about 2,600 revolutions per minute. Messrs. Ford and Wright, whose "diamond factory" in Clerkenwell is the largest in the world, are strongly in favour of the use of electric motors; though their own gas engine, an invention of Sir Henry Bessemer's, does its work without any noise, and with hardly a vibration—for the engine and the polishers do their work in separate rooms. The experiment at the Colonial Exhibition only showed what could be done with the new force. Even Messrs. Ford and Wright's method of supplying power, though inferior to the electric method, is superior to that in common use. The machinery one sees in the Hatton Garden and Clerkenwell region is exactly the same as the cumbrous machinery of the

Amsterdam workers. It is somewhat noisy, and it occupies too much space—in other words, it means high rent. Master cutters say that the substitution of the new force for the old may be effected with the greatest ease. How easily, we have just had an opportunity of seeing at the workshops of Messrs. Hicks, the scientific instrument makers, of 8, Hatton Garden. Messrs. Hicks use a gas-engine for setting their machinery in motion. But in the basement rooms of their premises the well-known electrician Mr. Edmund is conducting his experiments with electric lights and electro-motors. Close to the gas-engine, on an upper floor of the building, he has a dynamo, which is worked by the engine, and which transmits its energy through wires connected with the basement. As already said, Messrs. Hicks's own machinery is set in motion by the gas-engine; but at the dinner-hour, when the engine was stopped, Mr. Edmund took the opportunity of showing us a pretty and most interesting experiment. The current which had been generated by the dynamo, sent down through the wires, and stored up in the "accumulators" at the bottom of the building, he now sent back again to the dynamo. The result was that the dynamo, or generator, became itself a motor for the time being; the whole machinery was set going again, while the gas-engine was at rest. Instead of a generator of motive force in each "shop," let there be one at a central station, just as in the case of electric lighting, and the problem of wiring "power" to customers is settled. By enabling them to economise space the change would benefit those who, as described in the preceding article, let out the floors, or parts of the floors, of their steam-power supply premises to master craftsmen and even to individual workmen. It would also prove of the greatest convenience to those among the smaller masters and individual workmen who might prefer to do their work at their own homes. And it might swell, however slightly, the sum of causes which tend to the revival of the gem-cutting art in England.

It is pleasant to quote here the opinion which one of the most skilled cutters in London or Europe entertains regarding the artistic capacity of the English. What makes his opinion the more valuable is the fact that he is a native of the country which, as already said, holds the leading position in this industry—Holland. His opinion is that there is more of artistic talent (though latent) in this country than in any other in Europe. The mere fact of the present progressive taste in architecture—the noble art in which England once excelled Christendom—implies a corresponding change in the taste for decorative art generally. But a more obvious illustration is to be found in the astonishingly rapid growth of free museums and galleries, of art schools and technical schools. There can be no doubt that the technical school may prove largely influential in reviving the particular craft with which this article is concerned. We are assured, by some of the most competent judges of this question, that the orders sent from London to the Continent—chiefly to Paris and Amsterdam—are sufficiently large and numerous to keep many thousands of London workmen in constant employment, only that the workmen are not to be had, so few having received the training. In speaking of employment, several industries which would be affected by the gem-cutter's and the lapidary's art must be taken into account. Only those who are engaged in this craft are aware of the risks attending the consignment of parcels through the post to Continental cutters. There is the risk of theft in spite of every precaution. And there is, rather too often, the risk that the stones consigned in their rough state may not be the same that are returned, cut and polished, to the dealer in London. These are good reasons why London dealers should get their work done at home if possible. It certainly seems odd that, though London is by far the greatest market in the world for diamonds and other precious stones, London dealers should be obliged to get most of their cutting and polishing done abroad. Not only is London the principal market, but the British Colonies—the Cape principally—are the chief sources of supply. Besides, the home demand for stones is steadily increasing.

Though the workmen in the Clerkenwell factory are now English, not very long since they were all Dutch. Many of these Dutch workers sometimes earned as much as sixteen pounds, and even more, per week. Wages were high at the period of the Cape "boom." But nowadays a good cutter and polisher is considered well paid if he makes from £2 10s. to £3 10s. per week. Having begun with the substitution of English male labour for foreign male labour, the Clerkenwell firm already named is prepared to go a step farther by giving employment to English women cutters. Only the women cutters are not to be found just yet. Clearly work requiring such extremely delicate manipulation as diamond-cutting should be specially suitable for women. What this delicacy means will be understood from the fact that even the smallest diamond is cut and polished into fifty-eight facets. In spite of the natural aptitude of women for this kind of work there is not, we are assured, a single woman employed as a diamond cutter and polisher in the London trade. It is different to some extent in Paris. In Amsterdam women are constantly employed, for the simple reason that whole families are. In Amsterdam workers are brought up to the craft almost from childhood. And skill is further encouraged by prizes given by the Diamond Cutters' Association. But here we come to the unpleasant side of the question. The Dutch workers, young and old, toil from early morning late into the night, and, if they are not Jews, seven days in the week. They work under domiciliary, sanitary, and dietetic conditions to which English workers, whether men or women, would not tamely submit. That is one reason why their labour undersells native labour in England.

Origin of the Diamond.

THE origin of the diamond is still one of the mysteries of geology. When the South African fields were discovered there was much astonishment to find the gem in a series of minerals quite different from those in which it had been hitherto found in India and Brazil. Instead of lying beside tourmaline, anatase, and brookite, it was mingled with a breccia of magnesian rocks which had evidently been pushed up from below; and a great variety of minerals, such as diopside, mica, zercon, and corundum, were embedded along with it. Some have supposed, according to the *Cape Argus*, that the diamond was originally formed where it is now picked up, and the presence of carburetted gas and carboniferous rocks is in favour of the idea; but, on the other hand, the broken condition of some of the stones, and other facts, make it far more probable that the diamond has been ejected from a deeper source. According to a paper by M. Daubrée, the well-known French mineralogist, recently read before the Academy of Sciences, the diamond issues from the infra-granitic regions of the earth's crust, where peridot is prevalent; for it arrives at the surface along with that mineral and certain serpentine masses which result from the transformation of the latter. In New South Wales, for example, the diamond is found near basaltic eruption which traverse the Devonian and carboniferous formation. Moreover, the diamond has been detected in several meteorites—for instance, one which fell on September 4, 1886, at Novo Urei in Russia. This consisted of nickelled iron, peridot, and carbon, which contained a fine dust having the hardness of diamond, and burning in oxygen with the production of carbonic acid gas. The diamond dust was present in the proportion of one per cent. of the whole weight of the meteorite. Cubical crystals of graphite, believed to be formed from the diamond, have been found in the meteoric iron of Arva, in Hungary, and in meteorites from Youndegin, in Western Australia, and Crosby's Creek, United States. As it has long been known that the nether minerals of the earth's crust are similar to those found in meteorites, the occurrence of diamond in these bodies is in support of M. Daubrée's theory. M. Daubrée, in fact, has come to the conclusion that the interior of the globe is rich in mineral diamond. The volcanic vents which here and there have brought up a little of the inner store to the surface, are a proof of its extent and quality. But if the earth's core is partly composed of diamond, it lies too deep for working, and there is little chance of companies being floated to mine the Plutonian bed rocks.

Failure of a Bristol Jeweller.

A MEETING of the creditors of Alfred Michael, of Cambrian Villa, Ashgrove Road, Redland, and of 31, Wine Street, pawnbroker and jeweller, was held on the 14th ult., before the Official Receiver for Bristol (Mr. E. G. Clarke). Mr. T. D. Sibly, Mr. G. Mosely, and Mr. E. T. Collins appeared for the creditors. The Official Receiver stated that for some reason or other the debtor was not present. From information he received, he ascertained where Mr. Michael was likely to be, and not caring to incur the expense of sending himself to serve the proper papers upon him, he communicated with his department, and they sent a representative who saw him. An official from the Inspection Branch of the Chief Official Receiver's offices sent a report, from which it appeared that he was staying at the place in question with Mrs. Michael. He had some talk with the debtor, who stated that the Official Receiver in Bristol had taken possession of his property, and he had nothing else; he (debtor) had pawned certain goods, and the duplicates were in his hands. He had never taken away any stock, and he had not about him more than enough money to pay his hotel expenses (about £5). The official served the debtor with a copy of the receiving order, and warned him that if he failed to attend the meeting at the Official Receiver's office in Bristol, further steps might be taken. The debtor said he would go to his solicitor in Bristol on Monday, and act under his advice. Mr. Clarke stated that, as far as he knew, Mr. Michael had not consulted his solicitor, and he was not there; possibly he intended coming to his public examination. There was no absolute necessity for his attending that meeting, but it would be better for him to attend his public examination. He had no statement to read to them, but the debtor's liabilities were about £8,000. Mr. E. T. Collins, who held a proxy for the heaviest creditor (Mr. Michael, senior), had commenced an investigation with a view to a scheme or proposal, but the absence of the debtor put a stop to it. He thought the assets might be from £1,000 to £2,000. Mr. Collins stated that he thought they would be about £2,000 or £2,500, subject to realisation. The Official Receiver mentioned that, on the application of several heavy creditors, and as there was money to be taken and goods had to be redeemed, he appointed Mr. Collins special manager on certain terms. The whole business before them now was to appoint a trustee and committee of inspection to administer the estate. Mr. Michael, sen., who was a creditor for £6,014, and some other creditors, were in favour of the appointment of Mr. Collins as trustee. Mr. J. Hunt (Sheffield) asked for information respecting the father's claim. Mr. Mosely replied about four years ago there was a dissolution of partnership, and the father sold his share to his son, and had nothing for it but the covenant to pay. It was agreed that the affairs of the debtor should be administered in bankruptcy; and, on the motion of Mr. Platnauer, Mr. E. T. Collins was appointed trustee; and a committee of inspection, consisting of Mr. Platnauer, Mr. Northam, and Mr. J. Hunt, was also appointed.

Jewellery Robberies in the States.

ABOUT six weeks ago, says a Chicago paper, the police of the Central station became aware that a number of expert diamond thieves were in the city. Little else was known at that time, except that there were at least two men and one woman in the gang. Since then little or nothing has been learned concerning the movements of the thieves, further than that two robberies have been planned and executed successfully and one very clever attempt made and foiled. The miscreants first began operations by sending a messenger boy with an order over the forged signature of some wealthy and prominent business men to a dealer in diamonds. This message generally requested the dealer to send a few pairs of diamond earrings, a few rings, or some article of jewellery set with diamonds, for inspection and subsequent purchase, the plan being to intercept the messenger if the goods were sent, and either take the diamonds from him by force or by waiting at the address given in the order persuade the messenger to deliver the gems to one of the thieves, who represented himself as the person for whom the package was intended. None of the diamond dealers was victimised, however, in this way, as they were suspicious and made inquiries by telephone or otherwise before sending out the goods.

Finding the forgery plan would not work, the thieves adopted another and more successful one, by which the wholesale jewellers of the down-town district have lost about 4,000 dols.' worth of fine stones. A few days ago a member of the firm of Giles Bros., State and Washington Streets, was engaged in showing diamonds to a customer. At this establishment the diamonds are displayed on the second floor, and every precaution is taken against theft. The customer was known to the salesman, and entered the rooms, as the salesman thought, in company with a friend. This second person followed the purchaser at a short distance and the salesman had no suspicion that all was not right. The stranger remained in the store until the customer had departed. The next day the diamonds belonging to the firm were weighed as usual, and it was discovered that something like 1,200 dols.' worth were gone. The police have a description of the stranger who was in the store at the time mentioned, but have been unable to locate him.

Tuesday last, a fashionably-dressed man entered the store of S. Hyman and Son, at State and Madison Streets. He presented a letter of recommendation from one of the best customers of the house and asked to see some diamonds. The letter, as it was found afterward, was a forgery, but as the man only asked to see some goods the genuineness of it was not brought into question. The fellow asked especially to see earrings and brooches, and several trays containing the finest of these articles were brought out. He handled the goods freely and his conversation indicated that he had considerable knowledge of the trade. He finally left without purchasing, but promised to call again, saying there were several articles in the stock which suited his fancy. It was shortly discovered that the highly-recommended stranger had departed with a pair of diamond earrings and a diamond brooch. The value of the property is 1,800 dols. A good description of this man was obtained, but he has thus far evaded arrest.

Yesterday afternoon an elegantly-attired, closely-veiled woman came into S. Strelitz and Co.'s store, 98, Madison Street. She asked to look at some rings. A tray containing a number of fine white stones was placed before her. When she had gone it was found she had managed to retain two rings containing valuable diamond settings, and in their place were two other rings with "paste" settings. She has not as yet been apprehended. About three weeks ago the same game was played by a woman at Strelitz' establishment, and the woman succeeded in getting away with a ring worth 150 dols. Since that time the clerks have been very watchful, especially of persons who ask to see diamonds, but the woman of yesterday was evidently a "slick" one.

The Trade in Scotland.—The jewellers in Glasgow, and especially those who make marriage gifts a speciality, are, according to the *North British Daily Mail*, fairly busy; but, like the furnishers, they hope to be even more active in June and July, although they admit that if marriage gifts are to be made during these months they should be beginning to be purchased now. However, the customers they like best are the tourists, who will soon be upon us. The Americans, who generally arrive before the English, buy large quantities of Scotch-made jewellery—that is, brooches, etc., set with Scotch stones. There have been numerous novelties introduced this season in table silver-plate, and the jewellers are not like our forefathers, whose experience was that it was only the well-to-do class who gave valuable marriage gifts. They say that it is now quite the recognised fashion for friends not honoured with an invitation to the wedding to purchase as costly gifts as those who have.

The Metallurgical Arts at the Paris Exhibition.

Read before the Members of the Franklin Institute by F. Lynwood Garrison, Delegate of the Franklin Institute.

OWING to the refusal on the part of the French Exhibition officials to recognise any American commissioners other than those appointed by the United States Government, your representative has laboured under great difficulties in collecting the materials for his report. In the present instance he has been obliged to take much of his information at second-hand, and for the sake of accuracy, and a desire to give nothing that is not absolutely correct, he has been obliged to make the report much shorter and in some particulars more incomplete than it otherwise might have been.

During the past eighteen or twenty years the progress of the metallurgical arts in France has been equal to, and I believe in some instances greater, than in any other country in Europe. Paradoxical as it may seem, disastrous wars are often productive of the greatest good to a healthy, vigorous country. After the close of the Franco-German War, in 1871, the energies of the French people seemed, with one accord, to have been turned to the improvement and increase of their national armaments and railroad systems. This naturally gave an unprecedented stimulus to the iron and steel industries, but it does not, however, seem to have greatly increased the production of pig-iron and steel rails. The demand for iron and steel being mostly for military and naval purposes, the improvement in the metallurgical arts cannot be indicated by the number of tons of this or that kind of iron or steel produced, any more than the improvements and skill used in the manufacture of jewellery and silverware would be indicated by the number of ounces of gold and silver annually produced in the United States. Figures, therefore, might be misleading, and will not be given, except under their specific heads and places in this report. Although the production of war material has had a most important bearing upon the metallurgical industries of France, I find that information relating to it is particularly difficult to obtain; and what little I succeeded in getting amounts to but a few generalities, which, perhaps, may not be unknown to you. I believe it is generally admitted that the French at present surpass all their neighbours in the manufacture of light and heavy ordnance, and that their present facilities for manufacturing large gun forgings, and rolling armour plate, are equal to, if not somewhat greater, than any other country in the world. In the matter of iron and steel ship-building the French have progressed very rapidly, and as a naval power rank second to England. In the improvements of harbours, building of bridges and other engineering works requiring a large consumption of iron and steel, an equal progress has been made. Great advances have also been made in the improvements of the railroads, in the motive-power, road beds, and their most excellent terminal facilities.

Turning now from the iron and steel industries to the consideration of the other metals, the French, during the past decade, do not seem to have made so much progress in the metallurgical arts as applied to them, but on the whole, however, they may fairly be said to hold their own.

Taken in its entirety, the great Paris Exhibition of 1889 gave a most satisfactory and vivid representation of the power, resources and wealth of the French nation. To anyone who thought that France had seen her best days it was a great surprise; truly, France is yet a great country, and with a good Government, the genius, thrift, and industry of the people should make her once again the greatest of the continental powers.

Coming now to the details of the report, I have taken up one by one the metals which are of any especial importance in the arts, leaving iron and steel and the consideration of fuels to the last.

Aluminium.—I observed five different exhibits of the productions of this interesting metal; those of the Oldbury Works, of Birmingham, and the Alliance Aluminium Company, of London, in the British department; of a Swiss company, located at Neuhausen-on-the-Rhine, using the Héroult process, in the Swiss; of Bernard Frères, of Creil, in the French department, the Société Électro-metallurgique Française, 43, Rue Saint Georges, Paris, with works at Froges and at Champ (Isère); and also that of the Cowles Electric Smelting and Aluminium Company, of Lockport, N.Y., in the American department. None of these exhibits were extensive, and to a casual observer, not interesting. They represent, however, an enormous expenditure of thought, energy and money, as there has been nothing in the history of metallurgy which has attracted so much popular and widespread interest as the reduction and manufacture of this metal. It remains to be determined if the results obtained are worth the expenditure. It is my opinion that until this metal can be produced as cheap as say tin or copper, it will have but a very limited use in the arts. At the present time, its principal use is in the form of its alloys with copper and iron or steel. The properties of aluminium bronze are well known; when containing ten per cent. of aluminium, an alloy is produced having a tensile strength in the neighbourhood of 100,000 pounds to the square inch. Its effects upon the properties, when alloyed in small quantities of iron and steel, are not so commonly known, but are even more striking. In general, it may be said that it lowers the fusing point of iron and steel, and, as a rule, produces a more compact and homogeneous metal. This property which aluminium appears to have of lowering the fusing point of difficulty fusible metals is a very valuable one, and will doubtless become of great use in the arts.

The Oldbury Aluminium Works, near Birmingham, are probably at the present time the largest and richest in the world. They use the process invented by Mr. Hamilton Y. Castner, a young American chemist.* It is a modification of the old Deville process, and consists essentially in the cheap production of metallic sodium by means of a carbide of iron in iron retorts; the reaction being as follows:

$$6\ \mathrm{Na\,HO} + \mathrm{Fe\,C_2} = 2\ \mathrm{Na} + 2\ \mathrm{Na_2\,CO_3} + 6\ \mathrm{H} + \mathrm{Fe}.$$

As the cost of reducing the aluminium is in direct proportion to the cost of the metallic sodium used for the purpose, the process, as a matter of fact, is chiefly one of producing cheap sodium.

The aluminium oxide ($Al_2\,O_3$) is treated with carbon, chlorine and common salt ($Na\,Cl$) in regenerative furnaces forming a double chloride of aluminium and sodium.

$$\mathrm{Al_2\,O_3} + 3\ \mathrm{C} + 6\ \mathrm{Cl} + \mathrm{Na\,Cl} = \mathrm{Na\,Cl\,Al_2\,Cl_6} + 3\ \mathrm{CO}.$$

The aluminium chloride ($Al_2\,Cl_6$) is thus formed with the metallic sodium under a flux of cryolite ($Al_2\,F_6 + 6\ Na\,F$) giving the following reaction:

$$\mathrm{Al_2\,Cl_6} + 6\ \mathrm{Na} = 6\ \mathrm{Na\,Cl} + 2\ \mathrm{Al}.$$

I have been informed that this company is producing aluminium at less than 2.50 dols. per pound, and are getting from 3 dols. to 4 dols. in the London market.† The Alliance Aluminium Company, of London, claim to produce their metal 99·5 per cent. pure. They use the Netto process at their works at Wallsend-on-Tyne.

Like the Castner process, its aim is the chief production of metallic sodium, which is effected by percolating molten caustic soda through a column of hot charcoal in a cast-iron retort. The caustic soda is reduced and the vapours of sodium are condensed. The residue, consisting chiefly of sodium carbonate, is withdrawn through a tapping hole in the lower part of the retort. Each retort produces from 80 to 100 pounds of sodium per day. Again, as in the Castner process, the metallic aluminium is produced by a slight modification of the old Deville process, *i.e.*, the decomposition of a halogen aluminium salt by metallic sodium. Instead of forming a double chloride of aluminium and sodium, cryolite (a double fluoride of aluminium and sodium, is used. The cryolite is melted in a reverberatory furnace and then brought in contact with metallic sodium, the following reaction taking place :

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*The Franklin Institute was the first scientific body to recognise the merits of this process by the award of one of its medals.—F.L.G.

† September, 1889.

$$Al_2 F_6 + 6 Na F + 6 Na = 2 Al + 12 Na F.$$

By adding sulphate of aluminium to the 12 Na F, it can be reconverted into artificial $Al_2 F_6$.

$Al_2 F_6 + 6 Na F + 3 Na_2 SO_4$ dissolving the $3 Na_2 SO_4$ out with water.

The Héroult process, used by the Swiss Company, is an electrolytic process very similar to, if not substantially the same as, the Cowles electrolytic process used in this country.

This exhibit was, in some respects, more interesting than the others, as it contained quite a variety of castings, forgings, etc., of aluminium alloys; a cast bronze propeller, about eighteen inches in diameter, specimens of bronzes and brasses ranging from one to thirty per cent. aluminium. The latter alloy was a white, friable metal apparently worthless for any practical purpose. Ferro-aluminium containing as high as twenty per cent. aluminium, and bronzes and brasses forged, rolled and drawn were exhibited. The following table of tests of bronzes and brasses manufactured by this company were made in the Polytechnic School at Zürich, Switzerland :—

	Aluminium content. Per cent.	Tensile Strength in Kilograms per Square Millimetre.	Elongation. Per Cent.
Aluminium Bronze	11·50	80·	0·50
„ „	11·00	68·	1·00
„ „	10·50	63·8	6·30
„ „	10·00	62·1	10·50
„ „	9·50	56·0	16·10
„ „	9·00	51·6	39·20
„ „	8·50	48·0	37·80
„ „	8·00	45·0	45·70
„ „	7·50	40·7	25·50
„ „	7·00	35·7	27·30
„ „	5·50	44·0	64·00
„ Brass	4·00	69·0	6·50
„ „	3·00	60·0	7·50
„ „	2·50	52·0	20·00
„ „	2·00	48·0	30·00
„ „	1·50	45·0	39·00
„ „	1·00	40·0	50·00

The Cowles process is not an electrolytic process in the true sense of the term. The action of the electric current is essentially a smelting one. The intense heat produced by the arc formed between the carbon electrodes, together with the carbon present, reduces the Al_2O_3 to metallic aluminium which is taken up by the metallic copper added to the crucible for that purpose.*

The Héroult process differs in that a large bunch of carbon rods constitute one electrode and the crucible itself the other. Otherwise, the two processes are practically alike, the reduced aluminium being taken up by metallic copper, or some other metal in the same way. The molten alloy just formed is tapped from the crucible from time to time, thus making the process to a certain degree continuous.

The Société Électro-metallurgique Française exhibited pure aluminium; ten and thirty per cent. aluminium bronzes; aluminium brass with sixty-four per cent. of copper, thirty-three per cent. of zinc, and three per cent. of aluminium; ten per cent. silicon copper and fifteen per cent. ferro-aluminium. I do not know what process or processes this company are using.

The establishment of Bernard Frères, of Creil, exhibited a case full of ingots, bars, etc., of aluminium made by the process used by them, which is that of M. Adolphe Minet, also an electrolytic one, in the correct sense of the term. The inventor submits to the influence of the current a mixture of fluoride of aluminium and sodium together with chloride of sodium (cryolite and salt) in the proportions of thirty to forty per cent. cryolite, and sixty to seventy per cent. common salt. This mixture is maintained in the state of igneous fusion, the bath being sustained by constant additions of alumina (Al_2O_3), which dissolves freely in the fused fluorides constituting the bath. The electrolysis of this mixture results in the liberation of metallic aluminium at the cathode and of free fluorine at the anode. The latter at once displaces the oxygen of the alumina dissolved in the bath forming fresh aluminium fluoride, and the oxygen displaced attacks the carbon anode and is evolved as carbonic anhydride.

The sodium fluoride also undergoes decomposition, yielding up its sodium by interaction with the aluminium fluoride present, thus causing the liberation of an equivalent of aluminium, and reforming sodium fluoride.

It should be observed in this connection, that the process of Hall, at present used by the Pittsburgh Reduction Company, and whose operations have lately attracted wide-spread attention, is based on precisely the same reactions as those just indicated. Hall dissolves alumina in metallic fluorides (using for the purpose various mixtures) maintained in igneous fusion, and decomposes the fused mixture by the electric current; the result of this operation is the production of metallic aluminium in exactly the same way as in the Minet process. The strength of the bath is similarly maintained by additions of alumina (Al_2O_3) from time to time.

Hall claims, however, that the fluorides in his bath play no part in the electrolysis, acting simply as a solvent of the Al_2O_3; but there appears to be no reason to believe that the sequence of reactions in this process differs from that in the bath of Minet just described. These two processes may, therefore, be considered to be identical in all substantial respects. Which of the two is entitled to precedence in the order of priority, we have not been able to ascertain.

They appear to represent the most advanced state of the art in the economical production of aluminium. The Pittsburgh Reduction Company quote their metal ninety-six to ninety-seven per cent. pure, at two dols. per pound in 1,000 pound lots, which is a reduction in price of nearly fifty per cent. over that of all other manufacturers; and, at the present time, we are informed, the works are turning out large quantities of the metal. To what extent Bernard Frères, at Creil, are working this process we have not been able to ascertain. I have, however, been recently informed that they are working it to a considerable extent. *(To be continued.)*

Presentation to the Rev. James Leighton, of St. John's Church.

THE lecture hall of the Technical College, Bradford, was filled on April 29 by the members of the congregation of St. John's, Horton Lane, to witness presentations to the Rev. James Leighton, B.A., of St. John's College, Cambridge, and the retiring curate of the church, on his acceptance of the living of Thornton. Mr. Leighton has laboured in St. John's parish for nine years, and not only in his spiritual duties, but in developing the social intercourse between the parishioners, the rev. gentleman has endeared himself to the whole of the community connected with St. John's.

The proceedings were of a very pleasing character. Mr. H. Coates, the organist and choirmaster, arranged a capital vocal programme, and the audience appreciated the performances of the vocalists, who included Messrs. Hobbs, Knight, Calverley, Connelly, R. Wood, H. Cookson, Greenwood, and J. S. Taylor, and Miss Coates and Miss Schofield. The vicar (the Rev. J. G. Nash) presided. The presents made to the Rev. James Leighton were as follows:—

From the vicar, a silver pocket Communion Service; from the congregation, an illuminated address, marble and bronze clock with ornaments to match, and a purse of one hundred sovereigns; from the Portland Street Mission, an onyx library clock; from the organist and choir, oak hall table and chairs; from the young men's Bible class, a handsome study cabinet; and from the scholars of the Ashley and Carlton Street Sunday Schools, a case of Cavendish cutlery. To Mrs. Leighton the ladies of the congregation presented a silver afternoon tea-service and a case of silver spoons. The address was presented and read by Mr. G. M. Loft, the vicar's warden. Mr. Loft said that while the congregation regretted for themselves Mr. Leighton's departure from St. John's they rejoiced for Mr. Leighton's sake at his promotion to the living of Thornton, and Mr. H. Butterworth, the people's warden, assured Mr. Leighton that when it became known that he was leaving the church, there was a spontaneous desire on the part of the congregation to mark their appreciation of his worth. Mr. H. Coates, making the choir presentation, said Mr. Leighton was the best friend the choir had had. In all their work he had taken the liveliest interest, and in their pleasures he had heartily partaken. To Mrs. Leighton they also wished to give their heartiest thanks, and they wished both of them long life and prosperity. The ladies' present to Mrs. Leighton was made by Mrs. Loft, and then Mr. C. Lupton presented Mr. Leighton with the present from the Bible class. He said one of the greatest problems connected with the work of Sunday schools was how to maintain a connection between the scholars after they left the Sunday schools, and in developing and bringing to its high efficiency the Bible class in St. John's parish Mr. Leighton had found a solution of the problem. Mr. H. A. Gaunt, Sunday school superintendent, made the scholars' presentation, and the vicar that from himself. He said the gifts which had been made that night showed how Mr. Leighton's labours had been appreciated; but, valuable as they were, he felt sure they did not express the high opinion in which he was held.

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* "Cowles' Electric Smelting Process." *Journal of Franklin Institute*, vol. cxxi., p. 111.

The Rev. James Leighton in reply thanked all his friends for the uniform kindness he had received at their hands, and for the great kindness and consideration he had received from the vicar during his nine years' ministry. Mr. Nash was a splendid organiser for church and parochial work, and to him was due much of any of the success he had achieved in his labours.

The National Anthem was sung at the close of the proceedings.

The clocks, vases, silver spoons, tea set, etc., were selected from the stock of Messrs. Fattorini and Sons, Bradford.

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

By Dr. C. A. Bucklin.

(Continued from page 278).

IN our last, says Dr. Bucklin, continuing his series of articles in the *Jewelers' Circular*, we finished the consideration of the nature of myopia, its inciting causes aud the important subject of the effect of heredity. We will now pass to the consideration of the selection glasses for myopic persons. The usual complaint of myopic persons having acute vision and who have no astigmatic or muscular complications is as follows:

They are unable to see at a distance distinctly, but they are quite enthusiastic regarding their ability to do fine work well at the working distance. In these cases simple concave lenses will bring the distant vision up to a satisfactory point without any trouble.

For the purposes of determining exactly what the true acuteness of vision is, you select the concave glass which gives the most acute distant vision. You then give the very weakest glass with which the individual can retain this acuteness of vision. You frequently meet complications which occasion uncomfortable and annoying vision. These difficulties are usually experienced in degrees of myopia of $\frac{1}{10}$ or over. The first cause of the complication is the general lack of accommodations which is a very general and almost constant difficulty in a myopic eye. The individual, although seeing distinctly and comfortably at a distance of twenty feet or greater, finds that objects appear annoyingly small when they are brought closer; this is caused by his inability to accommodate over the lenses as observed objects are brought nearer.

The nauseating sensations or swinging motion which many myopic persons experience when looking through their glasses are probably due to disturbances resulting from the abnormal relations existing between fixation and accommodation when the glasses are used. The second cause which occasions annoying sensations when concave lenses are worn, is any abnormal weakness of the ocular muscles, causing the disturbance between fixation and accommodation to be marked when the glasses are worn. This difficulty would not be annoying if the muscular defect does not exist. The third difficulty experienced in selecting lenses for myopic persons is the greatly-reduced acuteness of vision, very frequently found in high degrees of myopia, resulting from the damage done the retina when the stretching of the eye takes place in the posterior pole of the globe. Persons having myopia of $\frac{1}{5}$ will be encountered, having such defective vision from the above cause, that they are unable to decide whether the glasses improve vision or not.

Fortunately, however, there is but very little difficulty experienced in selecting distant lenses for myopic persons. The one caution to be observed is to give the lenses as weak as is consistent with satisfactory vision.

The class of myopic cases which give the opticians the greatest annoyance are those who not only have indistinct distant vision, but who also have what is unusual with myopic persons, annoying symptoms at the reading distance. Difficulties at the reading sistance in myopic people are due to the following causes, either dingly or combined.

First.—The myopia may be of such a degree that the far point of bi-nocular fixation is so close that the necessary degree of convergence cannot be maintained without fatigue.

Second.—Astigmatism may so complicate the myopia as to make vision at the reading distance very annoying without the use of cylindrical lenses. Either of the above difficulties may exist singly or combined as causes of weak vision at the reading distance.

Third.—Late in life presbyopia may be developed to such a degree that it is considerably in excess of the original degree of myopia. These individuals wear concave lenses for the distance and convex glasses for reading.

The methods used in overcoming the above difficulties bring us to the consideration of reading glasses in myopia, a somewhat complicated subject. The simplest way of overcoming difficulties of convergence is by the use of concave lenses. Persons who have learned by practice from childhood to read through their distance-glasses, develop a power of accommodation which is not usually found in the myopic eye; this enables them to read through their distance-lenses, the ability to do which in myopia is the exception and not the rule.

The majority of myopic persons who accept concave lenses for the reading distance will only accept sufficiently-powerful lenses to enable them to remove the work to such a distance that convergence can be maintained.

Some myopic persons, although having difficulties with convergence, will refuse to accept the weakest concave lenses. They complain that all objects appear disagreeably small. Hundreds of these persons in Germany are wearing simply weak prisms, bases in, and state that they derive great comfort from them. Graefe ordered many of the prisms which are worn to-day for the relief of the above-described difficulty. You will meet another class of myopic persons who will accept weak concave lenses for reading which are not strong enough to carry the working distance away far enough to relieve the difficulties of convergence; in these cases concave lenses will be used to relieve the difficulty, as far as possible, and additional assistance will be derived from the combination of weak prisms, base in, joined to the weak concave lenses.

When the astigmatism complicating a case of myopia makes it difficult to work at the working distance the necessary cylinders are selected as follows: Correct the myopia for the distance over these lenses and select the best cylindrical correction for the distance. You then remove the spherical lenses and the remaining cylinders will be the reading lenses required.

When both astigmatism and difficulties of convergence complicate the case, select the cylinders as mentioned and you may be obliged to combine with them one or both methods of relieving difficulties of convergence.

From the above it will be seen that myopic persons may wear as reading lenses any one of the following forms:

1—Simple convex lenses. Presbyopia being greater than myopia.

2—Concave lenses. Same as used for distant vision. This indicates good accommodation.

3—Weak concave lenses, for difficulties of convergence.

4—Weak prisms, bases in, for difficulties of convergence.

5—Weak prisms ◡ to weak concave lenses, for difficulties of convergence.

6—Simple cylinders ——— used alone for reading.

7—Simple cylinders ◡ simple c c, for correction of astigmatism and weak convergence combined.

8—Simple cylinders ◡ simple c c ◡ weak prisms, bases in ——— for correction of astigmatism and weak convergence.

From some one of the above lenses or combination of lenses, one should be able, after diligent experimenting, to overcome any difficulties experienced by myopic persons at the reading distance.

Following the article is a series of questions and answers of practical value to oculists and opticians.

Question.—I have a case of a man of 65 years—a printer by trade—both or either eye has triple vision. The full moon looks to him as three moons overlapping each other. Of course he has worn + glasses a long time, but this mixed vision is bothering him in near work; says that working on fine work for some time affects his spinal column and completely exhausts him. What can be done for him without coming to see you? If there are any suggestions as to what glasses to try on him would be glad to receive them.

Answer.—These difficulties are the result of irregular astigmatism created by multiple irregularities in the lens, when complicated by any error of refraction which can be corrected, its correction may assist the difficulty; when existing alone it cannot be corrected. It is not due to any disease and is not growing worse.

Question.—I had a case this afternoon that Dr. MacFarland had given up, so the young man said. MacFarland sent him to me and told him if he got no help to come back and he would recommend him to some New York specialist. If I can't do anything with him I will try and have him come to you. I have made only a partial examination, but I will give it to you and maybe you can give me some points, if I am able to make the case at all plain. Young man 25 years old. Eyes constantly in motion laterally. Has been so from a boy. Thinks it was caused by medicine. Is a paper-hanger by trade; can't see lines up and down in hanging paper. Gets worse and worse. Can't read anything on test-card at 20 feet. Sees horizontal lines on astigmatic fan very distinctly black, and all others are dim. Can see horizontal partitions in window-sash, but cannot see perpendicular unless bends over and looks sideways. Can read large letters on signs across street. Concave lens, weak, make objects look smaller. Convex lens, weak, make them look larger and nearer. Says he can read with book close to him, but his trouble is in his work. The best he can see is to read the third line on the test-card at 20 feet (reading three letters) by the use of $+\frac{1}{36}$ cyl. ax. 90°. What do you think of it? Is it probably muscular or is there a possibility of mixed astigmatism? If you will kindly spare a little time and give me a pointer I will be very thankful.

Answer.—This case is one of lateral nystagmus. The motion of his eyes cannot be controlled, and but slight improvement can be obtained by glasses. Any improvement you can gain by lenses will be thankfully received by him. The doctor is a little disposed to try and fool you when he sends a case of nystagmus to be treated by glasses or any other method. A very high degree of astigmatism should be carefully looked for.

Question.—Below I give you the result of an examination of a young lady's eyes, which I have just had occasion to test. $V = \frac{20}{40}$ — in both eyes, with $-\frac{1}{72}^{s}$ ◡ $+\frac{1}{36}$ cy. ax. 90° $V = \frac{20}{20}$. Then, too, for some reason or other, she has experienced other difficulty aside from poor vision. If she looks quickly or steadily at a given object her eyes converge and cramp, as she expresses it, so as to produce a sharp pain in the eyes; exposure to cold weather also produces the same effect. I thought the possibility of a muscular difficulty, and obtained, by examination, the following results: base up 5°, base down 8°, base in 7°, base out 21°. This amount of muscular power is not in accordance with the instructions I received from you, but I was not sure just what was best to do with this muscular trouble; give prisms combined with the first formula or not, and if they should be given in what position of base and strength. This case somewhat puzzled me because of three of the muscles overcoming more prismatic power than your instruction called for.

Answer.—The vision appears to have improved to a satisfactory degree by the glasses, but such glasses could not have been discovered except by accident through direct experiment. Such a formula could only have been discovered by the use of $-\frac{1}{72}$ c. ax. 180 ◡ $+\frac{1}{72}$ c. ax. 90° which could have been transposed into the formula given in the letter. I should suspect a higher degree of refraction or some muscular defect or a conscious belief on the part of the girl that she looked pretty when she gave her eyes an agonising stare. Possibly she has a $\frac{1}{12}$ of hyperopia which is latent. Careful experiment alone can decide these questions.

Question.—A man can read XV at ten feet, but he says it is not as good as it used to be. No. 60 periscopic concave improves the right, and No. 48 periscopic concave improves the left. Periscopic convex improves reading. The two horizontal lines on the astigmatic chart are the darkest ones.

Answer.—The person evidently has simple myopia astigmatism requiring a concave cylinder, the strength of which from the statements shown should be about $-\frac{1}{48}$ c. ax. 90°. The facts given are, however, not sufficiently numerous or clear for one to draw a very intelligent conclusion.

Question.—A customer of mine commenced to use glasses 25 years ago, his natural sight for reading returned six years ago, but cannot see in distance twenty feet or more, now uses No. 14 concave for distance, but does not give entire satisfaction; age 70. What is the matter with his eyes?

The patient has that swollen condition of the lens which takes place during the development of senile cataract, and which is called second sight. He will gradually become blind from cataract, after which the cataract may be removed and vision may be restored. During this period of the development of second sight, persons experience remarkable improvements from prayer, electricity, and various means, which improvements take place in spite of anything done, and not as a result of anything they have done.

Legal.

IMPORTANT TRADE CASE.

DAVIDSON V. JONES AND OTHERS.

(Before Mr. Justice A. L. Smith *and a Common Jury.)*

MR. Kemp, Q.C., and Mr. Moses were counsel for the plaintiff; Mr. H. Winch, Q.C., and Mr. Hammond Chambers appeared for the defendants.

This was an action to recover £277 10s. for goods sold and delivered, brought under somewhat peculiar circumstances. The defendants pleaded that the goods were not sold and delivered, and that they were stolen from their premises without any negligence on their part. The plaintiff is a dealer in diamonds and jewellery, residing at 79, Parkhurst Road, London, and the defendants carry on business in the same line at 368, Holloway Road. From the opening statement of counsel it appeared that the defendants wished to do business with the plaintiff to the extent of some £1,000 in precious stones, but the plaintiff only delivered them to the extent of about £500. On December 13, 1889, the goods in question—a diamond necklet, worth £265, and a butterfly, price £12 10s.—were delivered to the defendants, as the plaintiff alleged, "on sale or return." Under this Mr. Kemp contended that the defendants took them at their own risk, and the property passed to them, and if they did not sell the diamonds they were bound to return them according to the contract. The necklet was exposed in the window of the shop in the Holloway Road. It attracted a good deal of attention, amongst others of some people with whom the proprietors would rather have dispensed, for on February 15 last some evil-disposed person broke the window with a stone, and, having abstracted the necklet and the jewelled butterfly from the screen, made off with them, and they were never recovered again. Mr. Kemp contended that this bailment "on sale or return" passed the property in the chattels to the defendants, and that they must bear the loss. But, besides, there was evidence of negligence, if such was not the law, as the defendants had exposed these valuable goods in a window in such a dangerous neighbourhood as the Holloway Road without any protection like bars, though they had been warned by the police of the danger they ran.

The plaintiff was called in support of his case, and said he lived some five minutes' walk from the defendants' shop. He dealt in diamonds, loose stones generally, which he made up, but he did not keep a shop. He had had dealings with the defendants for some seven or eight years. The defendants had at first offered to make good the loss by bills at nine, ten, eleven and twelve months, but the plaintiff had declined this arrangement. Afterwards, on consulting their lawyer, the defendants had declined to pay. The terms of business with the defendants were some goods "out and out," some "on sale or return," or on approbation, but he never left goods with the defendants to try and sell for what they would fetch. The defendants were to have whatever was obtained beyond a certain limit. That would be to make them his brokers, and to render him liable to them for commission on the goods sold. The defendants asked him to lend them the goods for sale; he had not requested them to let the goods remain in their window. The defendants' goods were equally protected, or the reverse, in their window. He thought they were unsafe, but he did not remonstrate with the defendants; they were not very fond of suggestions. They had pooh-poohed a suggestion of his as to insurance of the jewels. Holloway Road was different from the Strand or Bond Street; and Mr. Middleton had a guard on his shop in the Holloway Road. Mr. Barnett, in Holborn, had one in his window for a valuable pearl necklace worth £1,000. The jewels were stolen between 9.30 and 10 p.m. on February 15. He had had the necklet himself on December 6 from Mr. Bowman "on sale or return"; he had it previously in August, and had returned it to Mr. Bowman; he had paid for it on April 24, 1890.

Mr. Bowman, called by the plaintiff, said he was a diamond merchant of over 20 years' experience. He had delivered the necklet to the plaintiff "on sale or return" in July or August, 1889; he had had it several times. In the trade "sale or return" meant either sell the goods or return them. The custom of the trade was that the man took the risk of loss to whom they were delivered. He had a guard on his shop window when anything expensive was put up.

Mr. Cave, a jeweller in St. James's Street, Mr. W. Cartwright, an insurance broker, and other witnesses gave evidence in support of the plaintiff's contention as to the custom of the trade in the matter of the risk and as to the necessity of having a guard in the window.

Mr. Targett, a detective-sergeant, saw the jewellery exposed in the defendants' shop at the end of December, 1889, and he spoke to Mr. Ernest Jones about it, saying there ought to be a guard there. The shop was beautifully lighted, and a policeman stood close to it.

To his Lordship: The man was looking another way when the window was broken, but he was there just after.

Mr. Kemp: They always are.

The witness: This is a good neighbourhood, with fine houses there, and the defendants pay £600 a year for their shop. Previously I saw the plaintiff looking round the shop rather suspiciously. I certainly suspected he was going to "have a go" for those jewels.

Mr. Nunan, an inspector of police, described the premises on the night of the robbery, and the account given of it by Mr. A. Jones, who was alone in the shop and had just served a customer, when he heard a crash and saw a hole through the window. He rushed out of doors and gave chase, as the cushion was gone. Two men ran away. He pursued them, but returned, recollecting that there was no one in the shop.

Cross-examined: The plaintiff said on the Thursday following, "It was my property, and they had it in the window as an attraction." The defendant made no observation when he was told of this.

This closed the plaintiff's case.

Mr. Winch opened the defence, saying it was an unfortunate case for either party, as there was no dishonourable conduct imputed to one side or the other. The conflict was—what was the real bargain in this instance? There were, he asserted, three classes of business transactions; and this was the third class, where no invoice was sent, the goods to be sold for what the defendants could get for them. The plaintiff denied this third-class transaction ever took place. This expensive article was put in the window to oblige the plaintiff, as it was not the sort of article which the plaintiff usually sold to the defendants; the books showed these seldom exceeded £50. The negligence imputed as to the guard and not having insured was unreasonable to impute to the defendants, as to guard the window detracted much from the beauty of the articles exposed; it was the suggestion of wiseacres after the event. There was no duty cast on them to insure the goods; and he would prove that there were other persons in the shop than the one man cavilled at by the plaintiff.

Mr. Ambrose Jones, one of the defendants, was then called. They had been in business, he said, 35 years; he himself about 18 years. There were three kinds of transactions—(1) sales out and out; (2) "upon sale or return," or "on appro," which was the same thing; (3) to exhibit and sell. The plaintiff requested him to try and sell this necklace for him, and he never received an invoice for it. They only got goods "on appro" to show to customers; they did not exhibit such goods in the shop window. The goods they put in the window were for their own benefit. They never returned goods to the plaintiff, but always gave them back at any time he asked for them.

Mr. Jones, one of the defendants, and father of the last witness, called, said he had some goods from the plaintiff "on appro," but he could not produce the invoices; they were destroyed on the settlement of the account. This varied from three to twelve months. He had exhibited a diamond necklace before. They sold goods in the window at their own prices, and paid the plaintiff his price. His son thought he would oblige the plaintiff by putting the necklace in the window. He could not say that it helped the sale of his other goods; there was, perhaps, a little mutual accommodation in the matter. He wished the necklace had not been so attractive. They kept the shop open up to 9 o'clock on Saturday night. They had very respectable customers come in at that hour. If they had sold the necklace they would have put some £90 in their pockets.

Mr. Ernest Jones, son of the last witness, also gave evidence.

Mr. Jesse Howes, of a firm of shop-fitters in extensive business, said it was not necessary to have a guard on such a window, in his opinion, nor was it usual to place them there.

Other evidence of the same kind was given.

Mr. Kemp then replied on the whole case, saying the case was one of the highest importance, not only to the parties, but to the whole trade. For if the defendants succeeded in discharging themselves from liability in this case they would have to alter their whole course of dealing and make such contracts as would protect themselves. It was clear this was "on sale or return;" there was no trace of brokerage in the matter.

If the necklace had been sold, the defendants would have put some £85 in their pockets; all the plaintiff would have had was £10 profit. The custom undoubtedly was that goods "upon sale or return" passed as the property of the owner; this was established beyond contradiction by the plaintiff's witnesses. As to the negligence in not putting up goods, that also was quite clearly made out: negligent acts did not cease to be negligent because they were done 99 times out of 100 without disastrous consequences to those who did them.

Mr. Justice A. L. Smith then summed up, saying that in this case there was no imputation of any kind cast on either of the parties; it was, unluckily, a question of which of two innocent parties should suffer for the wrongful act of a third. The conflict in the case was what were the terms of the bargain—whether the goods were handed to the defendants "upon sale or return" (see "Key v. Frankenstein," 8 Scott's N. R., 839, probably misreported and not law, and "*Ex parte* Wingfield *in re* Florence," 10 Ch. Div., 59), or to sell as brokers or agents on some other terms. Now the plaintiff said he bought the necklace from Mr. Bowman "on sale or return" for £255, and passed it on to the defendants on the same terms for £265. The defendants denied this latter part, and said it was deposited with them for exhibition and sale as agents or brokers. But what were the usual terms of brokerage? That the principal got all the profit on the article sold and paid his broker his commission. But this did not appear to be the mode of dealing here. If the defendants had realised the £350 put upon the necklace the profit would have gone into their pocket. And the plaintiff asserted that the goods were at the defendants' risk as long as they remained in their possession and control. If the goods were deposited with the defendants as agents or brokers they were bound to take due and reasonable care that the goods were not lost to the owners, and different obligations arose from those which attached if the goods were their own. The plaintiff asserted that the defendants wanted to have goods to the extent of £1,000 supplied to them; and the defendants said they had had the necklace in their possession before on the terms of sale on commission, and that they undertook to sell as agents only. The plaintiff asserted that he had sent an invoice with the goods to the defendants on December 13, 1889. This the defendants denied. If the jury thought this was true it told strongly for the plaintiff, for on the copy produced the words "bought of, on sale or return" appeared; and there would be strong documentary evidence written at the time. Which transaction did it look most like? Where was there any evidence of any terms being fixed by the parties as to price, profit, and payment of brokerage commission? Then as to negligence, the defendants had a duty cast on them to use ordinary care while they had charge of the articles and not to be guilty of negligence. He could not better define that than in the language of the Master of the Rolls, as "not doing what an ordinary careful man would do under ordinary circumstances, or doing what an ordinary careful man would not do under ordinary circumstances." There was strong evidence before them that guards were necessary to be used in windows of this kind with valuables exposed; there was also a large body of evidence that they were often not put up by large firms. As to evidence of the custom that the loss of goods "upon sale or return" fell on the bailee, the evidence was all one way in the plaintiff's favour. As for the detective, he would say one word—that if he had looked after the thief half as carefully as he looked after the plaintiff he would have done better.

The questions for the jury were:—

1. Was the necklace left on December 13, 1889, by the plaintiff with the defendants on the terms of "on sale or return," or as agents to exhibit and sell? Answer: "On sale or return."

2. At whose risk was the necklace exhibited on February 15, when it was stolen? Answer: At the defendants' risk.

3. Was there negligence in the defendants in keeping the necklace? Answer: Yes.

On these findings his Lordship entered a verdict and judgment for the plaintiff for £277 10s., with costs.

LEVY V. ROSENTHAL.

(Before Mr. Justice A. L. Smith *and a Common Jury.)*

This was an action by a broker *versus* the administrator of the late L. Rosenthal's estate to recover the sum of £171 17s. 6d., balance due on an account for the purchase of certain shares in the year 1888. The defence was a denial of any employment of the plaintiff, and in the alternative that the plaintiff was negligent in his capacity of broker, and, further, that the deceased was of unsound mind, to the plaintiff's knowledge, at the time he employed plaintiff.

Mr. L. Hart was for the plaintiff; Mr. Addison, Q.C., and Mr. Stillwell for the defendant.

Mr. Abraham Levy, the plaintiff, was called, and stated that he was a broker in African securities, and used to carry on business at 103, Hatton Garden. Prior to February, 1888, Louis Rosenthal had dealings with him. On February 1 he ordered 150 West Moodies at 2s. 6d. premium. On April 24 the company came out, but Louis Rosenthal was then in an asylum, so the shares were carried over. Nothing had been said about carrying over; in fact, he wanted to pay cash. The custom is, if the client is "good," to carry over; if "bad," to sell.

Mr. Justice Smith:—I shall tell the jury this is no custom in a legal sense.

Examination continued:—When the shares came out they were worth 15s. He bought through Mr. Charles E. Merville, a member of the Stock Exchange.

Cross-examined:—Louis Rosenthal died in January, 1889. He looked upon him as an "eccentric." That was the opinion in the "Garden." When the order was given on February 1, 1888, he knew deceased had been in an asylum. Deceased was married on February 8 against the wish of his relations, and on March 31 was again removed to an asylum. On February 1 deceased did a sword-dance over the fireirons in the office. He did not consider that, however, a sign of madness. As a matter of fact, West Moodies were quite "rotten."

Mr. Walpole and Mr. Myberg, of Hatton Garden, described Louis Rosenthal as "eccentric," but keen in business. He was "odd" at times, but certainly not insane. His marriage, however, was considered a "scandal" in the "Garden."

Mr. Rodrigues, a diamond polisher, gave similar evidence.

For the defence, Dr. Will, of Bethnal House, Cambridge Road, E., was called, and said that deceased was admitted to his asylum on December 29, 1887. He was raving mad and very insane. He was suffering from an incurable disease known as "general paralysis of the insane." It was a progressive disease. On January 10 he was taken home with a private keeper. He was unfit to manage his private affairs, and, in his opinion, would be so on February 1. He would be unfit to marry on February 8. On March 31 he was brought back. The disease had made progress.

Other witnesses gave corroborative evidence.

The jury at this stage intimated that they had made up their minds in favour of the defendant.

Verdict and judgment accordingly.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

6,148. J. B. Garnier, Manchester, for "Improvements connected with watches." Dated April 23, 1890.

6.959. B. Matthewman and E. D. Pride, London, for "Connecting electric globes or lamps to scarf pins, brooches, earrings, coronets, or any dress ornaments." Dated May 6, 1890.

7,092. Wm. G. Thomas, Liverpool, for "Reflecting Clock." Dated May 7, 1890.

7.124. W. W. Tambs, London, for "Improvements connected with securing hinged pins and the like, particularly applicable for jewellery." Dated May 7, 1890.

7.125. O. R. Wm. Weise and T. W. White, London, for "Improvements in electricity meters and in clocks." Dated May 7, 1890.

7,191. E. Edwards, London (a communication from S. Stern & Co., Germany), for "An improved self-closing spring watch lid." Dated May 8, 1890.

7,204. Jno. Rotherham, London, for "Improvements in means for securing watch caps." Dated May 8, 1890.

6,455. Jas. Kershaw, London, for "A novel construction or arrangement of fastener for securing watch and other pockets, and closing parts of garments and other articles." Dated April 28, 1890.

6,490. Emil Schweizer, London, for "Electrical clockwork for pendulum timepieces." (Complete Specification). Dated April 28, 1890.

6,634. Wm. P. Thompson, 6, Lord Street, Liverpool (a communication from Ludwig Marckwald, Germany), for "Improvements in watch or clock escapements." Dated April 30, 1890.

6,878. Robt. Schmity, London, for "An improved electric alarm device for clocks." Dated May 3, 1890.

7,336. Jno. Wm. Wignall, London, for "Improvements in and relating to clocks and watches." Dated May 12, 1890.

7,394. Jno. Davies, London, for "Improvements in scarf or necktie clips." Dated May 13, 1890.

7,396. Geo. Spiller, London, for "Improvements in folding eye-glasses and spectacles." Dated May 13, 1890.

7,471. Jno. E. Wallis, Hants, for "Improved means for compensating for the unequal strength of clock and watch springs, and springs of the same sort used in other machinery." Dated May 14, 1890.

7,481. G. H. Blackhurst, Birmingham, for "Improvement in manufacture of solitaires and links, for cuffs." Dated May 14, 1890.

7,681. Hy. H. Lake, London (a communication from E. S. Bradford, U.S.), for "Improvements in machines for printing dials for watches and the like." (Complete Specification). Dated May 16, 1890.

7,716. R. W. Vining and Wm. Smith, Liverpool, for "An automatic sporting time-keeper." Dated May 17, 1890.

7,723. G. Morgenroth, London, for "Device for preventing pocket-picking, or loss of articles from pockets." (Complete Specification). Dated May 17, 1890.

Recent American Patents.

Jewellers' Stock Plate. J. D. Planchamp	426,029
Mechanism for making Watch Cases. F. Ecaubert	426,118
Chain Link. J. W. Garland	426,177
Stop Watch. C. Schlatter	426,396
Thimble Embossing Machine. J. Browning	426,407
Joint for Spectacle Frames. B. I. Price	426,422
Holder or Clasp. S. A. Cohen	425,983
Fountain Pen. A. B. Hyde	426,021
Pen Holder. E. Faber	426,119
,, for Cripples. R. Ramsey	426,324
Thermometer Case. C. J. Tagliabue	426,400
Watchman's Time Recorder. C. E. Egan and H. F. Gray	426,438
Apparatus for Ornamenting Hollow Ware. E. T. Carter and R. P. Chapman	426,557
Fountain Pen. J. Holland	426,813
Eye-glasses. S. B. Opdyke	426,625
Watch Bow Fastener. O. R. Decker	426,927
Button. R. H. Lewis	426,999
Manufacture of Backs and Handles for Brushes, etc. W. M. Welling	426,630
Fountain Pen. C. W. Bowman	426,758
,, ,, Wm. W. Stewart	426,692
,, ,, E. Marble, junr.	426,853

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. TRUSLOVE, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

MIDDLESEX.

Westley, F. (Ann Westley, widow, trading as), 27, Old Bond Street, W. and 5, Napier Avenue, Hurlingham, optician. Unsecured Liabilities £559 8s. 9d. Deed of Composition dated May 13, 1890; filed May 20, 1890. Composition, 10s. in the £ payable within 21 days from registration hereof.

Creditors.		£	s.	d.
Baroux and Bion	London	27	0	0
Mogg and Wigg	,,	16	0	0
Tidswell, Joseph F. (executor of A. C. Newbold)	,,	113	0	0
Newbold, Alfred Wm.	,,	137	0	0
Sutton, Hy.	,,	30	0	0
Buck and Wootton	,,	11	0	0
Hatfield and Son	,,	27	0	0
Westley, Frederick Westley	Hurlingham	50	0	0
Curthew, John	Wallingford	50	0	0
Manning, Wm.	London	62	0	0

LINCOLN.

Sudlow, Thomas William, 306, Victoria Street, Great Grimsby, jeweller. Trustee, G. G. Poppleton, Temple Row, Birmingham, C.A. Unsecured Liabilities, £489 11s. Estimated Net Assets, £251 7s. 8d. Creditors fully secured, £6. Deed of Composition dated May 8, 1890; filed May 9, 1890. Composition of 6s. in the £, payable by 15 equal instalments, at 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16 months from April 1, 1890, secured by surety and assignment of personal estate in case of default, and covenant by debtor to assign his real estate to trustee if so required.

(No amounts given in schedule of creditors.)

LANCASHIRE.

Welch, James, 5, King William Street and 50, Mincing Lane, Blackburn, jeweller. Trustee, F. A. Hargreaves, Grimshaw Street, Burnley, C.A. Unsecured Liabilities, £1,159 7s. 10d. Estimated Net Assets, £490 4s. 11d. Creditors fully secured, £170 15s. Deed of Composition dated May 2, 1890; filed May 8, 1890. Composition, 6s. 8d. in the £, payable 2s. 3d. on October 10, 1890; 2s. 3d. on January 10, 1891; and 2s. 2d. on April 10, 1891, the last payment secured.

Creditors.		£	s.	d.
Edleston, Richard and Son	Manchester	220	2	1
Whalley, Jno.	Blackburn	178	0	0
Wilmot, E. D. and Son	Birmingham	164	5	10
Cunliffe, Brooks, and Co.	Blackburn	110	17	10
Martin, Hall, and Co., Limited	Sheffield	31	13	10
Rotherham and Sons	Coventry	25	2	11
Kirwau and Co.	London	17	7	6
White, Geo. and Sons	Birmingham	11	4	7
Parkinson, T. R.	Blackburn	72	18	4
Edleston, Richard (executors of)	Manchester	316	18	3
Parkinson, Mrs. Robt.	Blackburn	10	16	8

King, Horace, Saturday Market Place, King's Lynn, watchmaker, jeweller, and silversmith.

Creditors.		£	s.	d.
Milleret and Co.	London	13	7	0
Hines, R.	Birmingham	10	0	0
Cohen, Israel, and Co.	,,	10	0	0
Levi, E. N.	,,	10	0	0
White and Co.	,,	18	0	0
Myers, J.	Manchester	11	5	0

Total Estimated Amount—£91 17s. 2d.

		£	s.	d.
Preferential Creditors		27	7	0

Mudon, E. Sybella, 46, Kirkdale, Sydenham, jeweller.

Creditors.		£	s.	d.
Cooper aud Co.	London	25	0	0
Dawnot and Co.	,,	29	6	0
Eaborn and Honous	,,	13	18	6
Gollancy, A.	,,	16	15	0
Myers, Jos.	,,	13	14	11
Norman and Stacey	,,	15	0	0
Trimns, H.	,,	238	17	0
Waltin and Co.	,,	21	7	0
Herbert and Godpex	Ashford	11	6	8
Harvett, E.	Twickenham	17	0	0

Fully-Secured Creditors.		£	s.	d.
Walford and Gubb	Abergavenny	250	0	0

Preferential Creditor.		£	s.	d.
Pawley, C.	London	52	10	0

Sanders, Thomas, 24, Great Sutton Street, Clerkenwell, London, watch and clock material dealer.

Creditors.		£	s.	d.
Harris, M.	London	15	10	0
Koch and Co.	,,	11	16	8
Picard and Frère	,,	285	17	0
Todd Bros.	,,	27	0	0
Armstrong, C.	Birmingham	24	0	0
Parnham, T.	Walthamstow	55	0	0

Total Estimated Amount—£474 1s. 11d.

Fully-Secured Creditors.		£	s.	d.
Harris, M.	London	31	0	0
National Freehold Land Society	,,	280	0	0
Payne, —	,,	107	10	0

Total Estimated Amount—£418 10s.

Fileman, Henry, 49 and 51, Hornsey Road, 9, Priory Terrace, Acton, 51, High Street, Kingsland, 33, Church Street, Camberwell, 157, Queen's Road, Peckham, all London; and 45, High Street, Northfleet, pawnbroker, jeweller, and general salesman.

Creditors.		£	s.	d.
Attenborough, J. and C.	London (abt.)	30	0	0
Bryett, William	,,	60	0	0
Corper, Mrs. A.	,,	80	0	0
Frost, John	,,	373	0	0
Fileman, T.	,,	1000	0	0
Kipling and Co.	,,	52	16	4
Moss, Mrs. (executors of)	,,	911	10	0
Pascoe, Edwin	,,	71	15	6
Taylor, W., and Co.	,,	64	6	1

Total Estimated Amount—£2652 19s. 9d.

Fully-Secured Creditors.		£	s.	d.
Frost, John	London	2200	0	0
Fileman, John	,,	2400	0	0
Leopold, L. (trustees of)	,,	945	0	0
Moss, Mrs. (executors of)	,,	1400	0	0
Frost, John	,,	300	0	0

Total Estimated Amount—£7245.

		£	s.	d.
Preferential Creditors		36	3	6

LANCASHIRE.

Horrocks, James, 33, Cheapside and Vernon Bank, Vernon Street, Bolton, pawnbroker, jeweller, clothier, and draper. Trustee, James Kevan, Bolton, accountant, with a committee of inspection. Unsecured

Liabilities, £4,641 18s. 4d. Estimated Net Assets, £3,913 10s. 2d. Creditors fully secured, £2,182 17s. 8d. Deed of Composition dated April 22, 1890; filed April 28, 1890.

Creditors.		£	s.	d.
Blankensee and Sons	Birmingham	31	0	2
Hill, William James	"	12	5	0
Bank of Bolton, Limited	Bolton	1187	16	4
Horrocks, Dr. (executors of)	"	1025	0	0
Tickle, Mary	"	221	0	0
Keinch, Emma	"	102	10	0
Harwood, Robert	"	221	0	0
Winward, R.	"	21	10	0
Hardman, Joseph	"	223	4	7
Horrocks, W. H.	"	42	0	0
Dakyne, James	"	17	0	0
Smith, Dr.	"	40	0	0
Horrocks, W. H.	"	820	0	0
Horrocks, James	"			
Pickering, John	Hulton			
Greenwood and Fielding	Hebden Bridge	32	10	0
Cheetham and Sons	"	24	3	3
Beresford, S. and W.	Macclesfield	18	6	0
Hadden, —	Manchester	140	0	0
Rylands and Sons	"	39	13	3
Kay and Lee	"	14	7	9
Boyd, J. and Co.,	"	10	2	6
Sandiford, N. P., and Co.	"	10	16	0
Hyde, Thomas, and Co.	Oxford	10	19	1
Hindshaw, E.	Salford	204	0	0
Mather, Johu	Southport	105	0	0

Myers, Joseph, 14 (formerly known as 5), Duke Street, Aldgate, London, wholesale optician and jeweller.

Creditors.		£	s.	d.
Ansonia Clock Co.	London	67	7	10
American Trading Co.	"	61	12	7
Baden Clock Co.	"	268	0	0
British United Clock Co.	"	102	3	1
Judda, F.	"	88	11	6
Merzbach, Lang, and Fellheimer	"	277	11	1
Nathan, W., and Bros.	"	41	10	2
Ramiassen, Webb, and Co.	"	48	18	4
Brandon Bros.	Birmingham	35	17	0
Baker, C., and Son	"	19	12	6
Cox Bros.	"	79	10	0
Hazlewood and Turner	"	10	0	0
Levetus Bros.	"	29	6	4
Lotheim, M. and S.	"	68	5	6
Male and Jones	"	41	10	11
Nathan Bros.	"	85	12	6
Payton, F. W.	"	99	10	6
Pearce and Thompson	"	134	12	0
Rocker, J.	"	81	8	4
Reynolds and Westward	"	46	9	2
Smith Bros.	"	65	7	2
Webb, F.	"	65	4	11
Walton, G. E., and Co.	"	98	12	8
Lanerne, A., and Co.	Paris	26	10	6
Batt, J.	Sheffield	10	9	8
Jahreouhrea Fabrik	Tribeg	69	10	0
Winter and Adler	Vienna	11	8	0
Total Estimated Amount—£2,050 18s. 6d.				
Partly secured Creditor.				
Summais, J.	London	600	0	0
(Estimated value of security, £102 16s. 5d.)				
Liabilities on Sheet "F"		258	0	1
(Not expected to rank.)				

Bankruptcy Proceedings.

Fileman, Henry, 49 and 51, Hornsey Road, 9, Priory Terrace, Acton, 51, High Street, Kingsland, 33, Church Street, Camberwell, 45, High Street, Northfleet, and 157, Queen's Road, Peckham, pawnbroker, jeweller, and general salesman. Receiving Order: May 10.

Fileman, Henry, 49 and 51, Hornsey Road, 9, Priory Terrace, Acton, 51, High Street, Kingsland, 33, Church Street, Camberwell, 45, High Street, Northfleet, and 157, Queen's Road, Peckham, pawnbroker, jeweller, and general salesman. First meeting: 33, Carey Street, W.C., May 30 at 12. Examination: 34, Lincoln's Inn Fields, June 12 at 12. Adjudication: May 13.

King, Horace, Saturday Market Place, King's Lynn, watchmaker, jeweller, and silversmith. Receiving Order: April 22. First meeting: Court House, King's Lynn, May 2 at 10. Examination: same place and date at 11.

King, Horace, Saturday Market, King's Lynn, watchmaker, jeweller, and silversmith. Adjudication: May 5.

Long, Joseph Edward, Bishop's Stortford, pawnbroker and clothier. First meeting: Dimsdale Arms Hotel, Hertford, May 7 at 12. Examination: Shirehall, Hertford, May 7 at 1.

Michael, Alfred, Cambrian Villa, Ashgrove Road, Redland, and 31, Wine Street, Bristol, pawnbroker and jeweller. Receiving Order: May 3. First meeting: Official Receiver's, Bristol, May 14 at 12. Examination: Guildhall, Bristol, May 23 at 12.

Michael, Alfred, Cambrian Villa, Ashgrove Road, Redland, and 31, Wine Street, Bristol, pawnbroker and jeweller. Adjudication: May 16.

Moore, Thomas Alfred, 1, Gibbet Street, Halifax, jeweller and clothier. Receiving Order and Adjudication: May 1. First meeting: Official Receiver's, Halifax, May 15 at 11. Examination: C.C., Halifax, June 10 at 11.

Mudon, E. Sybella, 46, Kirkdale, Sydenham, jeweller. First meeting: 24, Railway Approach, London Bridge, May 9 at 1. Examination: Court House, Greenwich, May 20 at 1. Adjudication: April 29.

Myers, Joseph, 14 (formerly known as 5), Duke Street, Aldgate, and 13, Salisbury Road, Dalston, wholesale optician and jeweller. First meeting: 33, Carey Street, W.C., May 22 at 11. Examination: 34, Lincoln's Inn Fields, June 6 at 2.

Sanders, Thomas, 24, Great Sutton Street, Clerkenwell, and Clematis Villa, 45, Granville Road, Walthamstow, watch and clock material dealer. First meeting: 33, Carey Street, W.C., May 8 at 2½. Examination: 34, Lincoln's Inn Fields, May 20 at 11½.

Vassalli, James Anthony, 32, St. Nicholas Street, Scarborough, jeweller. Receiving Order: April 26.

Vassalli, James Anthony, 32, St. Nicholas Street, Scarborough, jeweller. First meeting: 74, Newborough Street, Scarborough, May 19 at 11½. Examination: Court House, Scarborough, June 3 at 12. Adjudication: May 7.

Administration Orders.

Jordau, Williau, 7, Westminster Villas, Lower Weston, lately at 40, Broad Street, Bath, insurance agent and watchmaker. £29 3s. 10d. Eleven creditors. May 8. No. 11.

Norman, Henry Mark, 90, Gladstone Road, Wimbledon, jeweller. £38 6s. 7d. Nine creditors. May 9. No. 20.

Bankruptcy.

Re Goldstein.—This was an application, before Mr. Registrar Hazlitt, for an order of discharge by Michael Eleazar Goldstein, a diamond merchant, carrying on business in Hatton Garden. The failure occurred in October last, the liabilities being returned in the statement of affairs at £2,996, and the Official Receiver certified that the assets had realised £218. Mr. Stewart appeared as Official Receiver, and Mr. F. C. Willis for the debtor, and also for creditors, in support of the application. It would appear that the bankrupt commenced business as a diamond merchant and jeweller about nineteen years ago, and he estimated that on August 23 last his affairs showed a surplus of £1,300. He stated that on that day, while travelling by railway from Margate to London, he lost a bag containing the whole of his stock of jewellery (which it was his usual custom to carry to and from his business), some cash, and the two books kept by him in relation to his affairs. At the sitting for public examination the bankrupt stated in detail the circumstances attendant on this loss, to which he entirely attributed his failure, and he was allowed to pass upon the evidence then given. The only offence alleged against him by the Official Receiver was that he had omitted to keep such books as were usual and proper in his business, and as sufficiently recorded his transactions and financial position within the three years immediately preceding his bankruptcy. It appeared that since the adjudication a sum of 4s. in the pound had been paid to the creditors, and they supported the application. They had investigated the case, and were satisfied with reference to the loss of the jewellery, and they considered the failure to be the result of pure misfortune. It was further represented that the bankrupt had traded to advantage for many years, and his creditors desired that he should have an early opportunity of making a fresh start. The bankrupt was briefly examined, and gave some details with reference to the books which he had kept in his business. He stated that his stock book and journal were both lost in the robbery. Mr. Registrar Hazlitt, in giving judgment, said it appeared to be a case of misfortune. The bankrupt had for several years conducted his business successfully, and in August last he had accumulated a surplus of £1,300. He was in the habit of going to Margate on business, and on one of these occasions he was robbed of his bag, which contained his jewels and memorandum books. The matter had been fully inquired into at the public examination, and the Official Receiver did not now find himself in a position to report that the jewels were not lost in the manner alleged. The creditors had also accepted the bankrupt's story as true, and there appeared to be no reason to doubt its truth. But in his Honour's opinion the books were insufficient, and the order of discharge would be suspended for nine months from November 28 last, when the bankrupt passed his public examination.

Meeting of Creditors.

Re Joseph Myers, 14, Duke Street, Aldgate, wholesale optician and jeweller.—The first meeting of the creditors was held on May 22 at the London Bankruptcy Court. The accounts show gross liabilities £2,910 0s. 7d., of which £2,549 4s. 1d. are expected to rank, against assets valued at £797 9s. 4d. The debts are largely due to creditors at Birmingham, who claimed to be represented on the committee of inspection, and eventually carried their point. Mr. Porter represented Birmingham creditors, Mr. Coburn appeared for London creditors, and Mr. W. H. Dale attended on behalf of the debtor. Mr. Leadam Hough (official receiver) having read through the proofs, said that the statement of affairs was not filed in time to furnish the creditors with the usual summary. The debtor commenced business in 1887 with £100. capital, and attributed his failure to lack of capital, to bad debts, to the fact that the expenses had exceeded profits, and to depreciation in the value of the stock as now estimated for forced realisation. The debtor had traded chiefly upon borrowed capital, and the immediate cause of the failure was that the lender of that money required payment of an overdue acceptance, and the debtor was unable to meet it. Since January, 1888, no net profit had been made, and the debtor had drawn about £2 3s. weekly. There was no offer, and Mr. Lawrence Hasluck, chartered accountant, was appointed as the trustee to administer the estate in bankruptcy. A discussion arose upon the appointment of the committee, Mr. Potter nominating Mr. F. Nathan (Nathan Brothers), Birmingham; Mr. Meirsbach, London; and Mr. Samuel Cox (Cox Brothers), Birmingham. Mr. Coburn fought for Mr. Simmons, the lender of the capital, to be placed upon the committee, and eventually the chairman declared that the committee would consist of Messrs. S. Cox, J. S. Meirsbach, and Joseph Simmons. The public examination is fixed for the 6th June next.

The Watchmaker, Jeweller, and Silversmith.

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